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# ANÆMIA OF PREGNANCY

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We may approach the topic of 'anæmia of pregnancy' by considering the wider subject of 'anæmias in pregnancy'.

It is not necessary to describe what amount of mortality and morbidity is caused by anæmia during pregnancy. In this poverty-stricken, malaria-ridden country, the general health of many women is below par. No wonder then that anæmia is so common here among pregnant women. Anæmia is a serious handicap to any individual; it is still more so to a pregnant woman, who has to bear the strain of pregnancy, childbirth and lactation. Often she succumbs to it, or, in the alternative, she is crippled by it,—and where the mother suffers, the baby cannot escape. Verily, healthy motherhood is the pivot of national vitality. So, not merely in the interests of the prospective mothers, but in the interests of the nation at large, the problem of anæmia during pregnancy should be adequately tackled.

## Forms of Anaemia

First, a few words may be said about anæmia in general. Anæmia may be due to diverse causes, which may be broadly grouped under three headings, *viz.*, hæmorrhage, faulty hæmopoiesis, and hæmolysis. Leaving out of account the hæmorrhagic anæmia, which stands on a different footing, we know that anæmia is more often due to failure or abnormality of hæmopoiesis than to hæmolysis,—or, in the words of Vaughan, it is more often dyshæmopoietic than hæmolytic.

Instances of *hæmolytic anæmia* are (*i*) anæmia due to malaria, kala-azar, etc.; (*ii*) anæmia due to septic infection, particularly infection with B. Welchii and anærobic streptococci; (*iii*) obscure forms of anæmia like acute hæmolytic anæmia of Lederer.

*Dyshæmopoietic anæmia* is a much wider group, and includes many important clinical types of anæmia, among which may be mentioned:—(*i*) Chronic idiopathic hypochromic anæmia and hypochromic anæmia induced by pregnancy, which are forms of microcytic anæmia caused by a deficiency of iron, the condition being favoured by hypochlorhydria. (*ii*) Tropical nutritional anæmia, which is a form of macrocytic anæmia caused by a deficiency of the extrinsic factor in the food. (*iii*) Pernicious (Addisonian) anæmia, which is of the macrocytic type and caused by a *permanent* failure of the gastric function with respect to the secretion of the intrinsic factor. (*iv*) Pseudo-pernicious anæmia of pregnancy, which is believed to be due to a *temporary* failure of the gastric function with respect to the secretion of the intrinsic factor, the normal condition being generally restored after childbirth.

Anæmia of the macrocytic type may also be caused by factors which interfere with the absorption or utilisation of the hæmopoietic principle formed by the union of the intrinsic and extrinsic factors.

These are some of the important clinical forms of anæmia, and do not represent all its types. In the matter of classification, we should take note of an important fact which has come out of the recent researches. It has been found that the classifications based on the size of the red blood cells or their richness in hæmoglobin are not exact; for the type of blood picture often changes with the progress of a case. For example, a patient may begin with a blood picture of the macrocytic hyperchromic type, but, during convalescence, may show a picture of the microcytic hypochromic type. So, in the grouping of cases, one should not depend too much on the blood-picture alone.

## Anaemias in Pregnancy

Coming now to the subject of anæmias in pregnancy, we may take a R.B.C. count of 5 million (or rather 4·8 million) and hæmoglobin value of 13·8 grams per 100 c.c. as the normal standard for a non-pregnant woman. This hæmoglobin value corresponds to 100% on Haldane's and 80% on Sahli's scale. Among the Indians the standard is somewhat lower.

During pregnancy, on account of the relative increase in the plasma volume, R.B.C. count may be depressed to 4 million, or possibly 3·5 million, and the hæmoglobin value may come down to 12 grams per 100 c.c., corresponding roughly to 85% Haldane and 70% Sahli. This is the so-called *physiological*

*anæmia of pregnancy*, which is, after all, only an apparent anæmia. The physiological anæmia can cause even further depression of the hæmoglobin value, but when the latter comes down to 10 grams of hæmoglobin per 100 c.c., corresponding roughly to 70% Haldane and 60% Sahli, it is believed that the condition is partly due to pathological factors like hypochlorhydria and inadequate diet, which intensify the effect of the hydræmic condition of the blood.

Anyhow, when the hæmoglobin falls below the last level, there is no doubt that the anæmia is distinctly *pathological*.

The *degree* of anæmia is mainly judged by the hæmoglobin value,—the red blood cells functioning largely as the carriers of hæmoglobin. The anæmia is regarded as *severe*, when the R.B.C. count and the hæmoglobin content fall below half their normal values, *i.e.*, when R.B.C. count is below 2½ million, and the hæmoglobin value is below 50% Haldane, or 40% Sahli, or 7 grams per 100 c.c. on the absolute scale. We should confine our attention to the pathological anæmias of pregnancy and consider particularly the severe types.

Now, all forms of anæmia which may occur outside pregnancy, may also appear as complications of pregnancy. They may be already present at the time of conception, or may appear during the course of pregnancy. In either case, pregnancy will aggravate the mischief, particularly on account of the metabolic demands of the growing fœtus.

Pregnancy also tends to *induce* certain forms of anæmia on account of the dietic deficiencies and gastric derangement common during this period. In this way, there may develop:—(*i*) hypochromic anæmia of pregnancy, (*ii*) tropical macrocytic anæmia. Etiologically, neither of these two forms of anæmia is peculiar to pregnancy but during pregnancy both assume a severe form.

There is, however, a third form of anæmia, which is more or less peculiar to the pregnant state. It is the *pseudo-pernicious anæmia of pregnancy*, which was called by Osler 'severe anæmia of pregnancy'. It resembles Addisonian anæmia in many points, but can be distinguished from the latter. Like Addisonian anæmia, it was at one time regarded as a hæmolytic form of anæmia. But like the latter, again, it is now linked with faulty hæmopoiesis. It is a serious condition, but generally the patient begins to improve spontaneously after childbirth, if she survives. This suggests that the break-down in the hæmopoietic system was only temporary. In Addisonian anæmia, however, the breakdown is more or less permanent.

A true hæmolytic form of anæmia sometimes develops during pregnancy. Fortunately, it is rare. It is probably the same condition as the acute hæmolytic anæmia of Lederer.

### Analysis of Cases

Below is given an analysis of 107 cases of anæmia in pregnancy, that were treated in the Carmichael Medical College Hospitals, Calcutta, in the years 1937-40.

There were three cases, in which anæmia was definitely due to conditions outside pregnancy. One was a frank case of ankylostomiasis. It showed the lowest hæmoglobin reading, *viz.*, 11%, with a R.B.C. count of 0·6 million, and recovered under specific treatment. Another was a case of amœbic dysentery, which ended fatally. The third one was a case of combined infestation with amœbæ and ankylostoma, which recovered under treatment.

In the remaining 104 cases, anæmia could not be attributed to any cause outside pregnancy. It is possible that certain cases of malarial origin were admixed with these cases, but the fact could not be proved. We now confine our attention to this group of 104 cases.

It is noticed that, though hypochromic anæmia is the commonest form of anæmia complicating pregnancy, this series shows a large preponderance of hyperchromic and orthochromic anæmias with cells of the macrocytic or normocytic type. This is probably due to the fact that the patients suffering from the latter type of anæmia are more seriously ill and seek hospital treatment. Cases were distributed between the two groups thus:—(*i*) hypochromic anæmia—10 cases; (*ii*) orthochromic and hyperchromic anæmia—94 cases.

As was to be expected for the hospital statistics, the cases of severe anæmia far outnumbered those of slight anæmia, the ratio of their incidence being 74:30. There were altogether 19 deaths.

Further details of blood-picture are shown in Table I.

Table I—Blood Picture (104 Cases with 19 Deaths)

| | *Hb. value (Sahli)* | *No. of cases* | *No. of deaths* | *Hypochromic anæmia* | *Orthochromic & hyperchromic anæmia* |
|---|---|---|---|---|---|
| 74 Cases | 10—20% | 14 | 6 (43%) | 3 cases (1 death) R.B.C.= 0·8—2 m. | 11 cases (5 deaths) R.B.C.= 0·6—1·1 m. |
| | 20—30% | 41 | 9 (22%) | 5 cases (3 deaths) R.B.C.= 0·9—2 m. | 36 cases (1 death) R.B.C.= 0·7—1·8 m. |
| | 30—40% | 19 | 3 (16%) | 1 case (No death) R.B.C.= 2·4 m. | 18 cases (3 deaths) R.B.C.= 0·7—2·2 m. |
| 30 Cases | 40—50% | 18 | 1 (5%) | 1 case (No death) R.B.C.= 3·3 m. | 17 cases (1 death) R.B.C.= 1·1—2·8 m. |
| | 50—60% | 12 | 0 | 0 | 12 cases (No death) R.B.C.= 2—3·4 m. |

The *age incidence* was as follows:

| | |
|---|---|
| Upto 20 years .. .. .. | 27 cases |
| Between 21 and 30 years .. .. | 60 cases |
| Between 31 and 40 years .. .. | 17 cases |
| Above 40 years .. .. .. | nil |

The *relative incidence in the different pregnancies* was as follows. It will be noticed that the highest incidence was in the first pregnancy (*vide* Table II).

Table II

| No. of Pregnancy | I | II | III | IV | V | Over V |
|---|---|---|---|---|---|---|
| No. of Cases | 23 | 15 | 15 | 16 | 14 | 21 |

*Incidence relative to period of gestation*—Below is shown the period of pregnancy month by month, when the patients

were compelled to seek hospital treatment. The largest influx of patients was in the eighth month.

| | | | |
|---|---|---|---|
| 1st to 3rd month | nil | 7th month | .. 23 cases |
| 4th month .. | 1 case | 8th month | .. 40 cases |
| 5th month .. | 3 cases | 9th month | .. 29 cases |
| 6th month .. | 10 cases | 10th month | .. 3 cases |

*Seasonal variation*—It was noticed that the rush of patients seeking admission increased from the month of August and became very great in the months of October and November, and began to diminish from February of the following year. The number of cases admitted each month during the period under review is recorded hereunder:

| | | | |
|---|---|---|---|
| January | .. 11 cases | July | .. 5 cases |
| February | .. 7 cases | August | .. 8 cases |
| March | .. 5 cases | September | .. 10 cases |
| April | .. 3 cases | October | .. 17 cases |
| May | .. 3 cases | November | .. 18 cases |
| June | .. 2 cases | December | .. 15 cases |

As regards the *economic status* of the patients, it was found that the incidence was greatest among the poor women of the lower and middle classes. Most of them were non-vegetarians.

As regards the *clinical features,* œdema was present in most of the cases. A large number of patients had traces of albumin in the urine, and a few of them were definitely toxæmic. Fever was present in about 60% of cases. Enlargement of the liver and the spleen was noticed in 46% of cases. Soreness of the mouth was noticed in only 9 cases; they were all cases of severe anæmia, belonging to the orthochromic-hyperchromic group. Diarrhœa was present in 26 cases—they were all cases of severe anæmia, 2 belonging to the hypochromic and 24 to the orthochromic-hyperchromic group. Jaundice was present in 5 cases of severe anæmia of the orthochromic-hyperchromic group; and in 1 of these cases hæmoglobinuria was also present, and this case ended fatally.

As regards *treatment,* the main item was intensive iron therapy along with injections of liver extract. 11 patients were given blood transfusions. Many patients received repeated intramuscular injections of whole blood. The percentage of recovery under only iron and liver therapy combined with intramuscular injection of whole blood in the different grades of severe anæmia was as follows:—

| | | | | |
|---|---|---|---|---|
| 43% | recovery | in cases | with Hæmoglobin | 10-20% |
| 70% | „ | „ | „ | 20-30% |
| 84% | „ | „ | „ | 30-40% |

A point that deserves mention is that anæmia is often complicated with toxæmia. Such cases perplex the clinician, because of the difficulty in the diagnosis. Still an early recognition of the condition is essential to regulate the diet of the patient and fix the line of treatment. In the beginning, the clinician will probably follow an intermediate path between the full treatment for toxæmia and that for anæmia, particularly as regards the question of diet. Later on, as he sees more of the cases, he will lean to one side or the other.

* Read before the Third All-India Obstetrical and Gynæcological Congress, Calcutta, April, 1941, at the opening of the symposium on this subject.

# THE QUESTION OF MORTALITY IN INFANTS AND CHILDREN IN INDIA LAYING SPECIAL EMPHASIS ON MEASURES TO CONTROL IT

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(*Continued from the previous issue*)

*Post-Natal Deaths*—Bad housing conditions such as overcrowding etc., are more closely related to postnatal rather than neonatal death. Wrong environment and overcrowding along with the preventive diseases such as gastroenteritis, pneumonia are the chief causes of postnatal deaths.

*Overcrowding*—The Health Officer of Bombay in his annual report for the year 1937 says that out of 8688 being the total number of deaths amongst infants, 6823 or 78·5 per cent of the total infant mortality occurred in families living alone in a single room or sharing it with others, and out of 35,455 births registered in the year, 24,967 or 70·4 per cent of births occurred in families living alone in a single room or sharing it with others. He also states that the rate of deaths amongst infants in a single room tenement per 1,000 births in such tenements during the year was 273 as against 272 in the year 1936; and that the proportion of deaths to births varies inversely as the number of rooms occupied by the parents. This is seen from the table shown below:

Infant Mortality by the Number of Rooms Occupied, for the Year 1937.

| *Number of rooms.* | *Births.* | | *Deaths in infants.* | | *Infant mortality per 1,000 births registered.* | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | 1936 | 1937 |
| Roadside .. | — | — | 29 | 0·3 | — | — |
| 1 room & under | 24,967 | 70·4 | 6,823 | 78·5 | 272 | 273 |
| 2 rooms .. | 6,051 | 17·1 | 1,298 | 14·9 | 235 | 214 |
| 3 rooms .. | 1,483 | 4·2 | 319 | 3·7 | 231 | 215 |
| 4 or more rooms | 1,473 | 4·1 | 141 | 1·7 | 98 | 95 |
| Information not available .. | 1,481 | 4·2 | 78 | 0·9 | 55 | 52 |
| Total .. | 35,455 | 100·0 | 8,688 | 100·0 | | |

Campbell (1929) in her report on infant mortality published for the Ministry of Health, London, also confirms the above statement saying that postnatal deaths come on an average from more overcrowded parts of a district, rather than from thinly populated areas. Regarding the economic conditions, the general idea or the myth as to the close relationship between poverty and high infantile mortality, has been firmly negatived by the Ministry of Health, London. In their latest report they mention that the intermediate class of the skilled labour has the lowest mortality and the upper middle class and the lowest class of unskilled labour have the highest; showing that the intelligence and efficiency of the parents to rear up their young ones go a great way in keeping the good health and the wellbeing of their infants. The same could not be emphasized as regards conditions prevailing in India where ignorance, superstition and parental neglect undermine the health and the wellbeing of the new born, and help in maintaining the high infant-mortality rate.

*Pneumonia*—In the highest number of deaths due to other causes pneumonia takes the precedence. Out of 8688 infantile deaths in 1937, as mentioned above in Bombay, 3191 or 36 per cent of deaths were only from pneumonia. Of these 3191 deaths, 2025 or 62 per cent of deaths occurred in the second 6 months of life. There are many reasons for this death rate which is higher in the latter half of the year and not so much in the first half. The first reason, I think, is that the infant has much rapid growth in the first 6 months of its life as is seen by the increase in its weight during that period. It exactly doubles its weight in that period, which it is never able to achieve in its whole life-time. The second reason seems to be the change in its diet between the 9th and the 12th month of its life.

An attack of measles generally precedes the attack of pneumonia which leaves the infant so very weak or which kills the infant. Again, no proper care is taken regarding diet and warm clothing, either because of poverty or social custom and superstition. The question of clothing seems to be still as strange and the idea amongst mothers attending our clinics and welfare centres is as it was some years back. The uneducated mother finds great difficulty in grasping the point, that clothings must be suitable to the weather and to the time of the day. "A cool head and warm feet" must be the ideal that is dinned in their ears, year in and year out, yet just the opposite to the above has been noted being practised by the attending mothers. How many babes, with "weak chest", which they get after measles or after an attack of pneumonia attend our clinics morning and evening underfed and underclad! I think that before they get such "weak chest", and soon after an attack of measles, etc., is over and if proper care is taken such as that of giving the infants cod-liver oil and proper milk etc., along with the use of warm clothings, many cases of bronchitis and pneumonia which often end fatally, could be prevented and infant mortality reduced to a minimum.

*Marasmus and General Debility*—This is another cause of the high mortality rate amongst infants. It is not a disease by itself, but a symptom-complex of many diseases. Its causes are congenital syphilis, malnutrition, overcrowding and bad hygiene. It is more common amongst artificially fed babies than the breast-fed ones and thus is more commonly seen in the upper and middle class babies than amonst the poorer class. The parents of the former classes of babies can afford to give their offsprings patent foods, artificial aids, etc., which the parents of the latter class can ill afford to their good fortune. This cause unfortunately, also gives another big figure of deaths as 2,454 deaths out of 8,688 amongst infants in Bombay for the year 1937 and thus comes second in the series. If only the nursing mothers were aware of this, they will not, with very slight or no known cause of difficulty in breast-feeding, resort to artificial feeding. It is to be found that nothing but starvation and unnecessary weaning in the case of the poor, and neglect and giving of too many patent foods in the case of the well-to-do bring on the above symptom complex with its high infantile mortality rate.

*Diarrhœa and Enteritis*—If mothers were not to think of this symptom so lightly as they do at present, many deaths from diarrhœa could be prevented. These mothers usually take for granted that diarrhœa is due to "teething", specially if it occurs in the second 6 months of life. When simple diarrhœa becomes infective and takes a very heavy toll of life amongst infants, then only people realise the real value of its prevention. The question of feeding takes a very important part in the occurrence of this disease. It is obvious, that diarrhœa is more common amongst artificially fed babies than breast-fed ones.

The causes are simple to detct. Firstly, the food may not be suitable. Secondly, cleanliness in feeding may be wanting. Since all the conveniences of artificial feeding, such as, bottles, teats, varieties of tinned milk etc., are found in the market; even our Indian mothers have also been tempted to give up breast-feeding on one pretext or the other. This breast-feeding is the baby's birth right and which, it so richly deserves to have for its well-being in after life. In my opinion, the Health Visitors in various clinics and centres should spend a lot of time in teaching the mothers attending their clinics or those they come across on their rounds, about the great benefits derived from breast-feeding; and also impress upon them that their babies' health, nay, even their very lives are in their own hands to make or mar.

Speaking about superstition one may mention that if a mother loses one or two or her babies, which loss may be due to some other disease such as small-pox, etc., still the mother might think that her breast-milk was bad and that is why her babies died. Her neighbours often lead her to wrong belief; and she is led to think that tinned milk is much better than her own. Similarly the giving of cow's milk, etc., to the new-born babies by their mothers, before the third day, inspite of vomiting, etc., by the infant showing that it does not need it also give rise to ailments like indigestion and diarrhœa. Here one may quote Cadogan who says, "If we follow Nature, instead of leading or driving it we cannot err . . . When a child is first born, there seems to be no provision at all made for it; for the mother's milk seldom comes till the third day; so that according to Nature, a child would be left a day and a half or two days, without any food, to me a very sufficient proof that it wants none." Diarrhœa may be found sometimes in breast-fed babies as well. Here the cause has been attributed to the wrong method of feeding. Such babies are found to be fed at all hours of the day and night. I think that this is a very good point to be stressed upon and dinned into the ears of mothers whilst giving a health-talk on "feeding by the clock". With such irregular habits one fails to understand why breast-fed infants should not suffer from indigestion and diarrhœa. The work of Budin showed that a great fall in infantile death-rate occurred in nearly all towns where a "milk-depot" and "infant consultation" had been established. The fall was found to be mainly in deaths from diarrhœal diseases, which traced in a large part was due to feeding of infants with contaminated food or to some other source of direct or indirect bacterial infection.

Ballard in his investigations reached an important conclusion that diarrhœa did not select weaklings exclusively as its victims. He ascertained the previous state of health of 332 children who died in the epidemics of 1881 and 1882 in England. "Of these, 141 or 42·5 per cent were recorded healthy, and some of them had been remarkably so from their birth until the fatal illness commenced. The remaining 191 or 57·5 per cent had

been either weakly from birth or having been born healthy and remained so for a longer or shorter time, had been subsequently weakened by disease antecedently to their fatal diarrhœal attack."

" 'Epidemic diarrhœa', like 'enteric fever' is a 'filthy disease'." Its victims die because they swallow contaminated matter, usually contaminated food. With all the 'legal barriers' and strictest 'health regulations' as regards the stabling of animals, their legality and care as regards all health regulations, that contamination comes! To me it seems, that, allowing for observance of legality, and care as regards all health regulations, that contamination occurs on dilution of milk in one form or the other. Even at the present times the milk is diluted with dirty water by many unscrupulous traders and carried from place to place in an open can with some straw in it, in many large towns in India. This contrasts well with the system in most of the rural areas of India by which the milk is supplied directly to the consumer by milking the animal at his very door, and so preventing much unnecessary handling and contamination. The above compares well and accounts for less cases of diarrhœa in infants in villages than in towns.

Diarrhœa in infants is also found to be very common during the rainy days in the summer, *i.e.,* during the months from May to September. In Bombay during the year 1937, 58 per cent of infants died in the above five months. Again 59 per cent died in the first six months of their life; and 41 per cent in the second six months from diarrhœa in the same year.

If mothers were to have the right advice and guidance from our welfare workers, the staff of well-established hospitals, the painstaking and conscientious general practitioners, on the right line of feeding and care of their babies, then the cases of diarrhœa and other infections would be much lowered and their fatal results prevented. In all medical schools and colleges, the pupils are taught about the various advantages of human milk and its great value in preventing infant diseases; but have they been taught about the difficulties that some mothers find in giving breast-milk to their infants, and how to deal with them! The start in life regarding regular and correct method of feeding is quite good as long as the mothers remain in the hospitals for the first ten days or so of their confinement; but later on when they return home, this important supervision and care is found wanting and brings in its wake the disastrous results from diarrhœa and infection as mentioned above. Breast-feeding is a very complicated process, and is not so simple as it seems. Still infant deaths from diarrhœa amongst breast-fed infants would not occur—even in a small percentage of cases, if the young and inexperienced mothers were not foolishly led away by the old custom and habit of feeding, "whenever the baby cries". From the above it will be seen how entirely preventable the diarrhœa in infants is!

*Small Pox*—In the above series of causes, small-pox also has a very heavy toll of infant lives. Here again, the high infant death rate could be prevented, if the Public Health Authorities were to be more strict in the matters relating to vaccination. In the year 1937, 165 infantile deaths were from small-pox, out of which 103 were between 6 and 12 months of age; and the remaining 62 being under 6 months of age. Out of this total of 165 infant deaths from small-pox, 150 were non-vaccinated cases. This shows the importance and value of vaccination, not only in preventing small-pox but also in checking its fatal results. The general idea is that vaccination is harmful if done to babies under six months of age. The same view is rampant amongst many members of our profession. I do not see in what way it is harmful. The results achieved at the present time speak for themselves and show that vaccination will stand the test of time.

*Diphtheria and other diseases*—In this series the death rate is as follows:—Eleven deaths were due to diphtheria, out of which seven were in the second half of the first year of life. Eighty-three deaths were registered from dysentery. I doubt very much this statement. Cases of diarrhœa with slimy stools are very often diagnosed as dysentery cases even in hospitals, where all the facilities for examining the stools are available. We are taught in our college days not to diagnose a case of dysentery, unless examination of stools has been done thoroughly; yet the same mistake is committed by the general practitioner year in and year out, either due to carelessness or lack of time and patience. Four deaths have been noted due to lung tuberculosis and twelve from other tuberculous diseases. Lung tuberculosis is found to be very rare among infants. Congenital syphilis is known to be another cause of death among infants. As many as 19 deaths from this cause have been noted, within the first six months of age in the Health Officer's report for the year 1937.

## Child Mortality

As already mentioned in the early part of the subject child mortality at different age periods are 3 to 5 times higher in India than in England. A high infant mortality rate goes *pari passu* with a high death-rate in the later ages of child-life as those infants who happen to pass over the critical stage of any illness remain very weak and become more liable to infection in their later lives. The Health Officer, Bombay, gives the percentages to the total mortality by age-periods in 1935, 1936, 1937 as follows:—

| *Age period* | *Total Mortality* | | |
|---|---|---|---|
| | 1935 | 1936 | 1937 |
| Under 1 year | 8455 (28·9%) | 8946 (29·9%) | 8688 (28·2%) |
| 1 to 5 years | 5537 (19·0%) | 5340 (17·8%) | 5740 (18·7%) |
| 5 to 10 years | 882 (3·0%) | 870 (2·9%) | 1029 (3·3%) |

Although the total is much less in children between 5 and 10 years of age, still the figures for other age periods are found to be steady in these three years. I think that this is because the children at these different age-periods suffer more from various infectious diseases, like small-pox, measles, etc., than those at an early age. Secondly, that, from this age, *i.e.,* between 1 and 2 years and also between 2 and 5 years, the children move about more amongst themselves; and are not so much in contact with their mothers being confined to one place only, as the infants and babies in arms. Thirdly, because they change their diet from liquid to solid food and thus are liable to more and more infection and other diseases. It is from the infectious diseases alone that they suffer more than the infants and the babies-in-arms; otherwise, disease like pneumonia, diarrhœa and gastroenteritis show the same percentage of mortality.

Ague and remittent fever are causes to which children between the age periods of 2 and 5 and 5 and 10 years are prone to fall victims easily. This rate is found to be a little more in the latter period, *i.e.*, between 5 and 10 years, rather than the former. 98 deaths occurred from the above cause amongst children between 5 and 10 years of age, and 85 deaths between 2 and 5 years of age as shown in the report of the Health Officer, Bombay. Since the above diseases are all preventable in one way or the other, why can't we do something and prevent this high rate of mortality?

MEASURES TO CONTROL MORTALITY IN INFANTS AND CHILDREN

For the control of this high mortality amongst infants and children, steps were taken in the Western countries, as early as the seventies and eighties of the last century. The public health measures undertaken then, decidedly showed a great fall in the general death-rate, although the infant mortality rate remained the same. Different countries started the Child Welfare Work from different aspects, and in this, France took the lead in establishing the first "Infant Consultation" in 1875. During the ten years, specially, 1890-1900, there appeared in France, an agency which proved to be the most important element in the Infant Welfare Movement. This was the 'Consultation de Nourrisons' for the question of feeding the infant and the child, and with this Professor Budin's name will always be cherished. Milk depots were started by him, and clean and healthy milk was supplied to feed mothers with poor or scanty breast-milk. The milk was supplied at different rates as (1) paying, (2) half-paying, (3) free. Thus mothers and children from various walks of life and of varying ages, were helped a great deal by this movement. Then in the year 1894, Dr. Dufour started what he called "Gout de Lait", the chief object of which was the systematic medical supervision of infants and the encouragement of breast-feeding by mothers and the supply of specially prepared cow's milk for those infants who could not be fed at the breast for one reason or the other.

In New York, Straus's attention was first directed to the subject by the heavy infant mortality in the years 1890-1892. He found this to be largely due to diseases of the digestive system. He concluded from his investigations that, the most immediately effective method of prevention would be "to place milk suited for infant nutriment, within the reach of the poor."

Amongst the steps, undertaken to reduce infant mortality rate in England, as early as 1837, registration of all infants within 42 days after their birth became obligatory on the part of the parent. In 1860, home-visiting by voluntary workers was first thought of in Manchester. Investigations and enquiries in epidemic diarrhœa were also undertaken in the year 1892. The First National Congress on Infant Mortality was held by Britain in 1906. Dr. Ballantyne recommended the provision of prematernity wards in connection with maternity hospitals; and it is interesting to note that before the year 1906, a beginning had already been made with prematernity hospital provision in England. At the same time acts were passed with regard to notification of births and for the control of the practice of midwifery. The "Notification of Birth Act" was passed as early as 1907, and was made compulsory for all in 1915. By this act it was made compulsory for the parent or any other person present at the birth or attending the mother, to notify the birth to the Medical Officer of Health of the district within 36 hours. Even notification of still-birth was required by it. This Act has a great influence on child-welfare work. The workers are helped a great deal to visit the new-born babies within a few days after the births took place.

In India, all the above ideas and measures were put together and framed up in a movement called "The Infant and Child Welfare Movement". In our country though the movement has been started from 1918, yet very little has been achieved in the last two decades. What we urgently require at present is more strict and compulsory legislation and then and then only we will be able to achieve something real and lasting. In those places where legislation is compulsory with regard to births, vaccination, etc., the punishments meted out to parents are not sufficient to have any deterrent effect on them. Poverty, social customs and wrong beliefs among our people make it still more difficult for us to cope with them in as smooth a manner as in other countries.

As Lane-Claypon remarks, preventive work is always difficult, and in all matters less attractive than curative. It is, but it should always be considered as the integral part of the infant and child welfare work. People are always ready to pity the sick and the poor, and hence hospitals and charitable institutions are built by philanthropic persons in most cases either to ease their conscience in this world or to get salvation in the next. But if the public were to pause and reflect on the root of every illness in infants and children, and try to strike it at its very beginning by establishing more and more infant and child welfare works and not misunderstand the movement which aims primarily and above all at prevention rather than cure, their advice and willing help in kind and money will go a great way in bringing about the much wanted reduction in infant and child mortality.

As already mentioned compulsory notification of births helps the workers to visit the new-born within a few days after their births have taken place. Even then, the only workers who remain in contact with these new-born right after they are discharged from the hospitals are the midwives and the health-visitors. They will be of very little help and use to the mothers in the matter of difficulties in breast and artificial feeding as also the private practitioners, in spite of their learning in detail the chemistry of milk and its composition if they are not armed with the throrough and exact knowledge and understanding imparted by such institutions as the Infant and Child Welfare Clinics. Unless the present system of teaching about the "Feeding in the First Year" is taken in hand properly in medical and nursing institutions, cases of neonatal and postnatal deaths will be on the increase.

In spite of learning the exact method of feeding, in spite of preparing themselves with the armaments against infantile mortality out of so many thousands of births which take place every year in India, how many infants are kept under care and observation by the meagre and small band of health visitors and district nurses! I am sorry to say that about 500 births or more in a year are being looked after by one solitary health visitor in the city of Bombay of which we are so proud and name it the "Urbs Prima in Indies". How can one person alone give her time and care to such a large number of births! Our experience proves that not more than 150 to 200 births

per year can be looked after with ease and efficiency by one health visitor. Thus there is ample scope and field for the willing young workers of our country in taking the Health Visitors' Course and helping in the reduction of infant and child mortality.

In India "Anæmia of Pregnancy" is a disease peculiar to us. It is responsible for a big percentage of maternal and infantile deaths proving that the mothers' health during pregnancy is an important factor in infantile morality. Here I may quote the words of Dr. Mhaskar (1939) who says, "Nutrition and health are closely bound together, but in no period of life is this tie so close as it is in pregnancy and in infancy, when the foundations of the future body are being laid down." Among other factors for infant and child mortality, I would like to mention one more which has drawn my attention, and that is, the age of mothers at the time of their first deliveries. It was generally seen that primiparæ before the age of adolescence had the highest maternal and infantile mortality rate. Balfour and Young (1929) say that among 847 consecutive primiparæ observed in Bombay Hospitals, the average age of these was 18·7 years. 75 among them were below the age of 17, *i.e., 57* were 16, 11 were 15 and 7 were 14 years of age. It was found that in the cases where the mothers were below 17, at the time of child-birth (*i.e.,* in the 75 cases of the above series) the incidence of maternal disease was rather higher and the average infant birth weight slightly less, than in the case of older mothers.

One may add to the above the havoc played amongst young pregnant mothers by the *purdah* system and the social custom of not being allowed to see sunshine or crossing the path of daylight upto 40 days after delivery. The mothers and infants in these instances are deprived of fresh air and sunshine which are the enemy of all diseases. The above gives rise to more infant deaths in the urban than in the rural areas; as in the latter the people live more in the open and lead wholesome outdoor lives. The figures given by the Public Health Commissioner in his report for the year 1937 are 156·5 for rural and 210·9 for urban areas for every 1,000 live births during that year. Only slow education of these young mothers and their relatives, by lectures, health-talks, lantern-slides, etc., in what we call "mother craft" will try to remove these old ideas and incidentally help in lowering the infant and child mortality rate.

### Control and Treatment

As regards control and treatment much could be achieved by propaganda work, education of the people as a whole, organisation of preventive work with thorough registration and stricter legislation.

Bundesen and others state in a short summary that the following measures, *viz.,* (1) improvement in obstetric care, both antenatal and postnatal, (2) better hospital nursery care, (3) avoidance of dangerous procedures and injudicious use of drugs, (4) use of measures to prolong pregnancy to full-term, such as progestin and vitamin E, and (5) employment of proper method of resuscitation, should bring a definite reduction in neonatal mortality.

McNeil (1940) also says that in the prevention of prematurity from other causes, provision of the best possible antenatal care will help a great deal. Experiments have shown that the use of vitamin E and progestin given from early pregnancy may help in the prevention of prematurity and incidentally reduce infant mortality. Similarly, the prompt placing of premature babies in incubators supplied with oxygen and constantly given the type of special care required for infants prematurely born have given encouraging results in a series of hospital cases. Lastly, as for pneumonia, which is an important cause of postnatal mortality, better obstetric care, both antepartum and intrapartum should help in its reduction since it will help in preventing complications of pregnancy, labour and prematurity.

Making available of large financial resources either from the State or private sources may allow medical practitioners, acting in conformity with the proper authorities to work in a well organised manner for the betterment of the new-born. Similarly, closer co-operation between the Public Health Services and universities, medical schools and voluntary and government hospitals than existing at present would further the above cause and help a great deal in the control measures.

I would ask you to consider for a moment the training of medical students in pediatrics. The course in this subject should be made more elastic and practical especially in those of its branches which are outside the range of general medicine, *e.g.,* neonatal health and disease, prophylaxis in infancy, therapeutics in childhood and the mental health of children. The above would require an efficient and augmented teaching staff, the utilisation on a much wider scale of clinical facilities of the public health services, and some rearrangement in the medical curriculum. Similarly, the training of nurses and health visitors should be more thorough from the pediatric point of view.

McNeil would have us concentrate our main attention and all efforts against neonatal deaths but I feel that in India where the infant mortality rate is very high, our first endeavour should be aimed at reducing the number of infant deaths occurring after the neonatal period. This is likely to lead to a speedy reduction in the infant mortality rate, as the neonatal death-rate presents a much more difficult problem to attack, as is seen by the work and reports of the authorities concerned.

Many authorities advocate the multiplication and improvement of our present organisations for infant welfare as the best means of reducing our infant death-rate. But it will be admitted that the primary cause of infants' death after the neonatal period lies in bad hygiene, bad nursing, ignorance of dietetics and most of all inefficient maternal care. It is against all these that the attack should be launched as the best means of controlling the infant mortality rate. Improvement of the education of health-visitors, nurses, child-welfare medical officers, medical students who are to be the future family doctors, in the art of infant hygiene would touch only a fringe of the subject in the stages of its control. What is required is the teaching of the vast masses of parents who must be educated and made to understand their responsibility as regards their infants in particular and the nation as a whole in general.

The above task is not going to be a child's play. It is an herculean endeavour requiring co-operation and understanding

of one and all concerned. It is not going to be achieved by sporadic visits of health visitors or doctors or by inducing mothers to bring their infants to child welfare centres by offering free milk, etc., as is done to-day by most of the authorities concerned. In my opinion the education if it is to be given, and if it is to reap a rich harvest in reducing infant mortality rate, should start at the very bottom. It must begin in the schools so that no mother can plead ignorance as an excuse for the deplorable condition of her infant. Some authorities suggest that legislation should make it possible to penalise those who fail to maintain a reasonble standard of hygiene in their home. This is a very good suggestion, but in a subcontinent like India, with all its castes, creed and colour, with all its poverty, superstition and ignorance I think it will be very hard and impolitic to start at this end of legislation and punishment when the course of education of young mothers and future would-be-ones in general and that of mutual understanding and co-operation of all concerned in particular could achieve some results.

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# NEED FOR A RATIONAL ATTITUDE IN LEPROSY

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The problem of leprosy is a vast and complicated one in India. Various aspects of this great problem has been considered in the excellent report of the Leprosy Committee of the Central Advisory Board of Health which has been published last year. I intend to discuss in this article the findings of this committee relating to the medical profession, medical institutions and medical teaching with the only object of drawing the attention of all concerned. These findings have been summarised in the report as follows:—

1. Medical profession and leprosy—instruction in leprosy has often been inadequate in the medical curriculum. Partly for this reason many doctors in India regard leprosy work as being for specialists only. It is stated that some doctors have unreasonable fear of leprosy which is less infectious than many other diseases which they will handle without fear. A modification of this attitude is essential.

2. Medical institutions and leprosy—medical institutions frequently refuse to treat leprosy patents either as in-patients or out-patients. There is no adequate reason why, if needing hospitalisation, non-infective cases should not be admitted to general wards and infective cases to infectious wards. The adoption of this policy would create a sounder outlook on the part of the medical profession.

3. Teaching in medical schools and colleges—the improvement of teaching in leprosy given in medical schools and colleges is an urgent need. Such teaching should be an essential part of the curriculum, with proper courses of lectures and demonstrations illustrated by adequate clinical material given by teachers with special training. It is recommended that the attention of the Medical Council of India should be drawn to this important matter.

These three aspects of leprosy as a medical problem are intimately related to one another and taken together represent a rather unpleasant but nevertheless true picture of the attitude of the medical profession as a whole and the medical authorities in particular. It is a common knowledge that patients with leprosy are not usually admitted in general hospitals and dispensaries for treatment either for leprosy or for any other condition. Patients are not admitted for leprosy treatment simply because there is at present no arrangement of treatment for such patients in these hospitals and dispensaries. What is most distressing, however, is to find patients with leprosy being refused admission even when certified by competent persons about their noninfectivity, and even when requiring immediate medical attention for such conditions as acute pneumonia or typhoid, or, needing surgical intervention for conditions like gangrene, acute abdomen, etc. This attitude proves only too clearly that although past theories and traditional notions about leprosy have changed, practices born of those theories and notions still remain.

Until even a few years ago leprosy was regarded as a hereditary, rapidly progressive, incurable and infectious disease which is liable to develop after a single contact, even if casual, with a patient suffering from leprosy. This popular conception together with ugliness caused in some cases by the disease engendered a feeling of abhorence and fear in the popular mind. This popular conception and feeling towards leprosy shared more or less by the medical profession in the absence of a correct scientific knowledge of the nature of the disease gave rise to the present system of providing for patients with leprosy in institutions exclusively built for them in a locality far away from human habitation, and all that could be done in these institutions in the absence of any scientific knowledge of treatment of leprosy, was to give the poor unfortunate sufferers as comfortable a home as possible where they would merely exist until freed from what everybody considered as living death. In recent years, however, scientific studies of leprosy have been made in India and elsewhere, and although no rapidly effective means of treatment or of prevention is yet available, it cannot be denied that such studies have resulted in a far truer insight into the nature of the disease, into the factors influencing the prevalence of the disease and into the factors involved in the fight between the tissues of the body and the invading organism. This knowledge makes clear the urgent need of considerably modifying our outlook and attitude towards leprosy. As a result of such studies in India the following facts are now definitely known: (1) Although leprosy is an infectious disease its degree of infectivity is very low. (2) About 70 to 80 per cent of the total number of leprosy patients in India are non-infective, only the remaining 20 to 30 per cent of the cases are infective. (3) Adults even after a close, continued and prolonged contact with an infective case of leprosy (*e.g.*, the wife of a leprous husband and *vice versa*) develop the disease in only about 5 to 10 per cent of cases. (4) The children remaining in contact with leprous parents develop the disease much more frequently. (This is the most important factor in the spread of leprosy). (5) Casual contacts rarely transmit the disease in adults, whereas in the case of children it is commoner. (6) Leprosy is commonly associated with bad housing and overcrowding, bad diet and debilitating disease, but they are not essential for transmission of the disease.

A study of the therapeutics of leprosy as I have already indicated has not yet been of any far-reaching value, but it has enabled the leprosy workers to enunciate certain general principles of treatment which if wisely followed have a definite value. These principles have been enumerated in the report of the Indian Leprosy Committee as follows:

1. Mass treatment by rule-of-thumb methods is useless. Each case must be studied according to the findings.

2. The treatment by special injection is only a part of the treatment. The treatment of other diseases, control of the patient's diet and regime, are equally important, and not infrequently surgical measures and sometimes rest in bed and special treatment are indicated.

3. Patients for injection treatment should be carefully chosen. The special injections are of value only in patients in whom the disease is active and not in cases in whom the disease is inactive and arrested but who may be suffering from the resulting deformities and trophic lesions.....

The present position of the results of treatment of patients with leprosy on such principles have been summed up in the report in the following statements:—

"If suitable cases are selected.....it produces clinical improvement, assists and accelerates the process of spontaneous arrest seen in many cases, and in some cases in whom the natural resisting powers are not quite able to keep the disease in check, treatment may turn the balance on the right side."

Dr. Heiser, a well-known authority, once made the following statements regarding the reults of treatment:

"There is so much difference of opinion as to what constitutes a cure in leprosy, that I hesitate to interpret results. But it may be said that there are thousands of persons in the world today who were once diagnosed as lepers but are now restored to their homes. No leprologist, no matter how experienced, can find evidence that these persons are still lepers, and so far as can be ascertained they are not capable of conveying leprosy. It is true that a few have relapsed; but what of that in comparison with the many that have remained well?"

Then, again, in order to get a concrete idea as to what these statements really mean I quote the following statements from the Annual Report for 1931 of the British Empire Leprosy Relief Association of which Sir Leonard Rogers, another well-known authority on leprosy and other tropical diseases, is the Honorary Medical Advisor:

"While the aggregate returns show a percentage of discharged cases of only seven per cent it must be remembered that many returns come from areas where the work is not organised, and the results shown are taken from cases which are chiefly advanced, and therefore the final figures are considerably affected. While seven per cent is the average discharge rate, and this can be taken as mean, in institutions or out-patients centres where good, bad and indifferent cases are treated yet in the better-run institutions the percentage of discharged cases may reach as high as 16 to 34 per cent of the total treated. It is seen then, that given early cases and proper institutional care and control the discharged rate increases considerably."

Dr. Fumio Hayashi of Aise-en, the National Leprosarium, Japan, came out to India in 1933 in the course of a study tour in the world. He visited many important leprosy institutions and left a record of his impressions of anti-leprosy work in India which was published in "Leprosy in India." Among other things he made the following statements:—

"Upon visiting Purulia (Purulia Leper Asylum), I saw a village near the leper home, where people, who were once untainted children and symptom-free cases, are living happily. The inhabitants numbered two hundred."

These various findings and statements are clear enough to make us realise that despite the inadequacy of our weapons there is no rational basis whatsoever for the attitude not infrequently adopted by the medical institutions and the 'vis inertia' not uncommonly seen in the medical profession. There is no adequate reason why, as recommended by the Indian Leprosy Committee, non-infective cases should not be admitted

to general wards and infective cases to infectious wards if needing hospitalisation. Sheer justice demands it. Apart from the 'vis inertia' of the medical authorities it is not improbable that objection to the adoption of such a policy in the medical institutions may at the beginning be made by a section of the nursing profession because of lack of knowledge of the recent advances in the scientific knowledge of the nature of the infection of leprosy. That should not, however, deter us. I have not the slightest doubt that they will make no objection whatsoever as soon as they will be convinced of the low infectivity of the disease. They are already handling much more infectious cases with impunity than leprosy. Constant contact with various diseases make them realise the characteristic nature of such infectious disease much more easily than many of us realise. So, when they will learn the nature of leprosy backed up by their own experience they will simply laugh away the idea of any infection from patients with leprosy. We should not allow our personal prejudices to get better of our reasons. The medical profession if it is to be worthy of its great mission must have the power to grow, develop and adapt itself to new conditions, and what is true of the medical profession is also true of the nursing profession.

Apart from the question of rationality and justice there is another equally important consideration, namely, the question of immediate utility. It is considered that one of the first and most important steps in the solution of the problem is to provide for a good teaching of leprosy in medical schools and colleges. This, however, is very defective at present for several reasons. One important reason is the lack of sutiable clinical material chiefly because the patients with leprosy are not admitted into the hospitals attached to medical schools and colleges. Obviously, no real improvement in the standard of teaching is possible unless the present attitude is changed. Secondly, leprosy is not included as an integral part of the medical curriculum. One may, however, say that it is included under the infectious diseases in the curriculum. By its nature it is so, but it goes by default because of lack of adequate emphasis. Recent advances in leprosy are not included in text books of medicine, surgery or pathology nor are they published in the general medical journals and, naturally, the teachers of these subjects are not as well informed as they might be and so they leave the subject alone. This defect may easily be rectified by arranging for special post-graduate courses in leprosy exclusively for such teachers. As for the clinical material they may be provided by adoption of a policy of admitting patients—as out-patients or in-patients—to the hospitals attached to the medical schools and colleges. The general adoption of a policy will take some time. In the meanwhile, some interim measures may be taken to improve the present standard of teaching. For example, in Bengal, we have two medical colleges and nine medical schools. Of these, two medical colleges and three medical schools are situated in Calcutta. Of the remaining six medical schools one is situated in each of the following places, namely, Bankura, Burdwan, Dacca, Mymensingh, Chittagong and Jalpaiguri. Of these seven places Chittagong, Mymensingh and Jalpaiguri have no special leprosy treatment centres and consequently clinical teaching in leprosy is difficult in these places. But in other places considerable im-

(*Continued at foot of next column*)

***MEDICAL PREPAREDNESS SERIES***

*The war coming on to the borders of India has revealed to us all the terrible aspects of the menace and it has become apparent that the profession shall have to take up quite a large share of responsibility in A.R.P. measures. A series of articles on war medicine, A.R.P. and allied subjects is being published with the idea of helping the cause of necessary medical education.* —EDITOR, *J. I. M. A.*

## BLOOD BANK

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In most countries of Europe and in the U. S. A. transfusion of blood is often a routine measure previous to certain surgical operations. Whole blood injections are also used for treatment of certain anæmias and infections. In this country, medical men may not have become equally blood conscious' yet, mainly because of the lack of efficient laboratory service which is essential in the therapeutic use of blood by the profession. During war, difficulties increase. However at the present time modern researches have revealed methods of combating shock by 'processed' blood and other substances which are easier than transfusion of whole blood.

"Shock due to hæmorrhage is caused mainly by the reduction in blood volume and not by the deficiency in its oxygen carrying capacity. This shock could be relieved by transfusion of serum or plasma (processed blood) which is free of blood corpuscles. This is as effective as and even safer than transfusion of whole blood.' (Mann).

A large number of wounded persons in air-raids would certainly suffer from shock and would require transfusion. Wounded troops in the front line also require transfusion. In peace time the demands on a transfusion service are not great

(*Continued from previous column*)

provement may be made by making the attendance of students compulsory for a fortnight at the out-patient leprosy clinics situated in these places. Students may attend these clinics in batches and learn the practical methods of case-taking and diagnosis and the techniques of treatment, both medical and surgical. In Calcutta, the students may, in addition, be provided with facilities of acting as clinical clerks in the Albert Victor Hospital at Gobra, which, by the way, is one of the best hospitals for leprosy in India. In Bankura, the students may be provided with similar facilities for clinical clerkship at the Bryan Leper Home and in addition they may gain practical knowledge of epidemiology of leprosy at the Rural Leprosy Investigation Centre under the Indian Council, B.E.L.R.A. In fact, Bankura provides in some ways one of the best opportunities of study in leprosy. Instruction of leprosy should be compulsory for the students of the fifth year in the medical colleges and the students of the third year in the medical schools.

Similar interim arrangements may be made in other provinces according to the available facilities.

and are met by personal donations of blood as occasion demands. The war has, however, created a greatly increased demand for transfusion materials now.

Organisations to keep up this supply in a constant and effective manner has led to the establishment of "Blood Banks" at Lahore, Bombay, and Calcutta.

A blood bank operates on the same principles as an ordinary bank. Individuals deposit and may withdraw their deposits at any time; though just as in an ordinary bank, it may not be the same blood that was deposited. No bank can function either in the commercial or therapeutic field unless periodical deposits are made to meet demands. In the case of a blood bank the necessary deposits can only be made by those who are willing and able to furnish blood. The giving of blood is in many cases beneficial to the donor, *e.g.*, in case of hyperpiesia. The average individual has about five quarts of blood. If a pint (about 500 c.c.) is given away once every two months it is replaced by the body in less than a week.

The Calcutta Blood Bank has been organised jointly by the Government of India and the Bengal Provincial branch of the Indian Red Cross Society. The Committee of the Blood Bank began its present operations in January 1942. It is now situated at the All-India Institute of Hygiene and Public Health in Chittaranjan Avenue with Dr. J. B. Grant as Director. Up to 9th January 1943, 22,611 donations have been collected here. From this, 4662 quarts of serum were processed. It is estimated that about 3000 pints of blood are required for every 100,000, population in peace time, how much more required in war with air-raids? The Calcutta Blood Bank's one year's efforts fall far short when compared with other bombed cities such as London or Moscow. Calcutta has however, collected more blood than the rest of India combined.

The work carried out at the Calcutta Blood Bank falls under the following main headings:—

1. Recruitment of donors (office)
2. Collection of blood (clinic).
3. Serological tests and processing of blood (laboratory).

Disposal of the processed blood to civil or military or emergency hospitals is the ultimate object of preparation and storage.

### 1. Recruitment of Donors

The recruitment of voluntary donors is done mainly by publicity propaganda. There is no arrangement at present to make payment to those persons who are willing to give their blood. Everyone should realise that donation of blood is self-protective and humanitarian. Any one of us may be wounded in an air-raid and require transfusion. No one should have the right to expect to use blood donated by others when he himself has refused the opportunity to donate to the common pool.

Volunteer donors have been quite effectively enrolled through existing community groups such as factories, firms, clubs, railways, this requires personal interviews with "managers" along with explanatory conferences with 'heads of departments' and talks to groups of employees. Experience indicates the necessity to explain why blood banks are needed, how does transfusion save life, what the individual may do. It will be realised that the Office of the Blood Bank has a great deal to do in connection with the recruitment of donors and collection of blood. Its manifold activities include, besides publicity propaganda, entering all new donors' names in a ledger, making appointments with donors, sending them instruction slips, preparing record cards which are permanent history of donors at the Bank, entering the results of Kahn test and blood groups on record cards when reports come from the laboratory, etc.

Each donor is advised as to his blood group and given a badge. "Follow up" of donors to make return appointments for further blood donations is also an important item. Other reports and returns are also required to be prepared in a big organisation.

### 2. Collection of Blood

*(A) In the Clinic:*

This is made either at the Institute or outside. The following staff can deal with 60 to 70 donors a day (8 hours).

| | |
|---|---|
| 1 Supervisory M.O. | 2 Laboratory assistants. |
| 4 Medical Officers. | 1 Laboratory attendant. |
| 1 or 2 Nurses. | 1 Sweeper. |
| 1 Lady receptionist. | 2 Peons. |
| 2 Dressers. | 1 Bearer. |

At the Clinic there are four cubicles so that four donors can be bled at the same time. Warm drinks such as tea, coffee, milk are given to each after the, collection of blood.

A physical examination of every blood donor is carried out and recorded on the Record Card which has appropriate headings printed. The donor is questioned about his recent illnesses and history of asthma or hayfever is specially entered into as blood of allergic cases are not suitable for this purpose. The heart and blood vessels receive special attention. A case with a systolic blood pressure of 100 or less is refused. The weight is recorded. Persons who are very myuch under-weight or of unhealthy appearance are unsuitable as donors. The age-period between 18-60 is acceptable.

The donor lies down on a high couch with his coat off and the shirt sleeve is rolled up to bare one arm. Belt and collar are loosened. The medical officer after washing his hands thoroughly collects the blood from one of the arm veins at the elbow. He takes out from a sterilised drum the "blood taking set" which consists of a rubber-tubing (inside diameter 3/16 inch and 1/20 inch wall) fifteen inches long, at one end of which there is a needle adapter and at the other is a thick silver needle which pierces the washer and goes into the bottle.

This bottle is sterilised with a paper covering the screw cap, labelled and numbered the same as the donor's record card. Such a bottle is also used for keeping serum for transfusion and is therefore provided with a wire loop attachment at its base for turning it upside down. The capacity of the bottle is just over 600 c.c. and there are marks indicating 100 and 500 c.c. The mouth has an internal diameter of 1·1" and is provided with an aluminium screw cap with two holes and a rubber disc washer ⅛". The bottles are autoclaved with the cap loosely screwed and after sterilisation, while still warm, these are tightly screwed in.

The venepuncture needle (gauge 13 or 14) is put on to the adapter and paraffinised to prevent any leakage. The needle

is flamed a little just before use. These sets are sterilised in autoclaves at a temperature of 120°C for forty minutes and the needles are sterilised by boiling in olive oil and kept in sterile petri dishes after sterilisation.

The arm of the donor at the elbow is cleansed with 70% alcohol and then painted with iodine which is later removed by a swab dipped in ether. It is seldom that more than one vein-puncture is necessary. The partial vacuum in the bottle helps the steady flow of blood which may be helped, if necessary, by suction from a vacuumised reservoir. Preferably 500 c.c. should not be exceeded. The total amount of blood drawn should not exceed 3·5 and 3·0 c.c. per lb of body weight in European males and females respectively and in Indian males and females 3·0 and 2·5 c.c. respectively. Two small sterile bottles are kept ready, labelled and numbered, (the same as the donor's record card). Specimens of blood, of the donor is collected in these bottles for Kahn test and grouping. The site of the puncture is swabbed with rectified spirit and sealed with collodion. The blood bottles are then sealed and sent over to the Laboratory where it is placed in a refrigerator till such time as it can be "processed".

(*B*) *Outside Clinics*:

Wherever a sufficient number of volunteers (15 to 20) are available at one particular place such as firms or government offices a team is sent out to the place for taking blood from these volunteers. The firm is sent a schedule first and requested to return it to the Blood Bank Office after filling up the names. Copies of instructions to donors are also sent to be distributed amongst the volunteers. The names and addresses on the cards are filled in by the Blood Bank Office and sent back with the team. In case of Clinics outside Calcutta the schedules and cards are all sent to the local organisers to be filled in. Local arrangements are made for supplying drinks to the donors after they have been bled.

A preliminary survey of the place is made for the selection of the clinic room. A clean well lighted room with an attached bath room is preferred but in the absence of such a room the clinic can be set up in any room and worked with the help of artificial lights. Some arrangement has to be made for plentiful supply of water for the washing of the hands of the operator and for washing soiled apparatus. Furniture necessary to set up the clinic are sent the day previous to the scheduled date for bleeding. The furniture consists of (*a*) one examination table with a mattress and a pillow; (*b*) two side tables; (*c*) two wash stands with basins; (*d*) one high stool.

The team reaches the clinic next morning, half an hour before the scheduled time with all the necessary equipment and is ready to begin work at the scheduled time. The blood bottles are brought back in ice chests packed with salt and ice.

In the case of clinics outside Calcutta and its suburbs the local organisers send an intimation at least 7 to 10 days in advance of the scheduled time as to the day from which the donors have been scheduled, probable stay of the team and the number of donors to be bled. A team is deputed for this work to reach the place at the scheduled time. A peon is sent everyday with the collection of blood to Calcutta and a peon leaves Calcutta everyday with supplies of bottles and sterilised blood-taking sets where there are no arrangements for autoclaving the sets. Each blood bottle has a paper cover put on the top of the cap to prevent water wetting the caps. Twelve such bottles are put into the insulated ice box in a rack and the rack is covered with a hood. Ice and salt in alternate layers of 3" are put round the tray. The water from melted ice is removed from time to time by means of a stopper at the bottom of the box. As soon as the boxes arrive at the Blood Bank, the packing is examined and the condition of the bloods as to hæmolysis or any signs of contamination are examined before these are put in the cold storage. Samples for Kahn test and grouping are sent to the Microbiology Department for the necessary reports.

The procedure described above (namely those of the Office and the Clinic) can be carried out at any centre if organised by local influential and energetic persons. The blood can be collected by any doctor obtaining sterilized bottles from the Blood Bank. The bottles can then be sent to the Blood Bank for further processing.

The big bottle is kept standing in the special cool room for 72 hours at 4° to 6°C. The "processing" now onwards is meticulously carried out by a specially trained staff and the various steps are controlled bacteriologically. Eventually stocks of whole blood, plasma and serum are always available in the special cool room and can be drawn upon as required for the benefit of suffering humanity.

3. Serological Tests and Processing of Blood

The two small phials of blood are utilised for carrying out the Kahn test, the result of which is entered in the donor's record card and also for determining the blood group, of which the donor is advised by letter. Standard methods are employed in both these procedures.

It is not the scope of this article to go into the particulars of the processing of blood but below is given a few remarks regarding the different items of "processed blood" which are the various transfusion materials available at the Calcutta Blood Bank.

All the three components of whole blood, *viz.*, (1) the cells, (2) the proteins and other elements and (3) the fluid are no longer considered essential for the treatment of shock in hæmorrhages and burns. In shock the indications are:—(1) to replace the fluid lost and maintain blood volume and (2) to supply the blood proteins and ensure cell vitality and activity. The cells (blood corpuscles) can be done away with.

So, now-a-days blood plasma and blood serum are considered to be the best transfusion materials in hæmorrhages and burns.

Plasma contains the proteins and in addition prothrombin, fibrinogen and complement. These elements, though not essential for combating shock, are found to be helpful in controlling hæmorrhage. Fibrin is precipitated gradually when plasma is kept in the liquid state and is then unsuitable for administration unless the fibrin is filtered out. But when plasma is kept in the frozen state or as a dry powder, it is very suitable. But these processes of keeping plasma in the frozen or dry state is very expensive and require elaborate apparatus.

TABLE SHOWING THE MERITS AND DEMERITS OF DIFFERENT TRANSFUSION MATERIALS (KRISHNAN)

| | *Whole Blood* | *Liquid serum and frozen plasma* | *Dried serum and plasma* | *Colloid and crystalloid solutions* |
|---|---|---|---|---|
| 1. Preparation. | Simple. | Less simple. | Complex. Special apparatus required. | Quite simple. |
| 2. Preservation. | In cold—4° to 6°C. | In cold: Serum—4° to 6°C. Frozen plasma 10°C. | At ordinary temperature. | At ordinary temperature. |
| 3. Keeping quality. | Poor—2 to 3 weeks. | Good. Several months to few years. | Excellent. Few years | Good. Few months. |
| 4. Transportation. | Very difficult. | Less difficult. | Easy. | Less difficult. |
| 5. Administration. | Less easy. | Easy. | Easy but has to be dissolved in pyrogen-free distilled water. | Easy. |
| 6. Dose. | Small quantity. Few hundred c.c. only. | Large quantity. 3—4 litres in 24 hrs. | Large quantity. | Large quantity. |
| 7. Typing. | Essential. Cross matching. | Not essential, Due to pooling. | Not essential. Due to pooling and drying. | Not required at all. |
| 8. Reactions. | Often present. Hæmolytic allergic, pyrexial, others. | Often absent. Mild allergic pyrexial. | Often absent. Mild pyrexial. | Often absent. Mild pyrexial. |
| 9. Efficiency. | Very good. | Good. | Good. | Poor. |
| 10. Good effect. | Lasting. | Lasting. | Lasting. | Not lasting. |
| 11. Risk. | Present due to cell rarely serum. | Absent. | Absent. | Absent. |
| 12. Serious complications: | In small per cent. | | | |
| (*a*) Hæmolysis. | | Nil | Nil | Nil |
| (*b*) Suppression of urine. | „ | Nil | Nil | Nil |
| (*c*) Death. | „ | Nil | Nil | Nil |
| 13. Communicability of infection. | Possible. A few. | Improbable. | Not possible. | Not possible. |
| 14. Diseases recorded. | Syphilis, Malaria, Filariasis, Allergic states, Influenza. | Syphilis? Allergic state. | Nil | Nil |
| 15. Clinical uses. | Blood diseases. Specially anæmias, Sepsis and severe hæmorrhage. | Shock and hypoproteinæmia arising out of hæmorrhage of all sorts and burns, etc. | Shock and hypoproteinæmia. | |

Serum contains the proteins, the liquid of whole blood minus the cells and the other elements of whole blood. Serum is as efficacious in treatment of hypoproteinæmia and shock as plasma. Serum can, therefore, be prepared and stored for use on a large scale for transfusion. But serum is a highly nutrient medium for bacteria and as such require the utmost care in preparation and storage, to avoid contamintion.

The day may not be far distant when the albumins of the blood will be prepared chemically in the pure state and concentrated solutions of these will be supplied for use. This will greatly minimise the risks of contamination and solve difficulties of transport from laboratories to far off stricken areas.

The relative merits and demerits of different transfusion materials are presented in the above table (Krishnan, 1942):

ACKNOWLEDGMENT

I am grateful to Dr. J. B. Grant and Dr. K. V. Krishnan for the facilities given to me.

REFERENCES

KRISHNAN (1942)—*Science and Culture*, 8:85-88.

# CASE NOTE

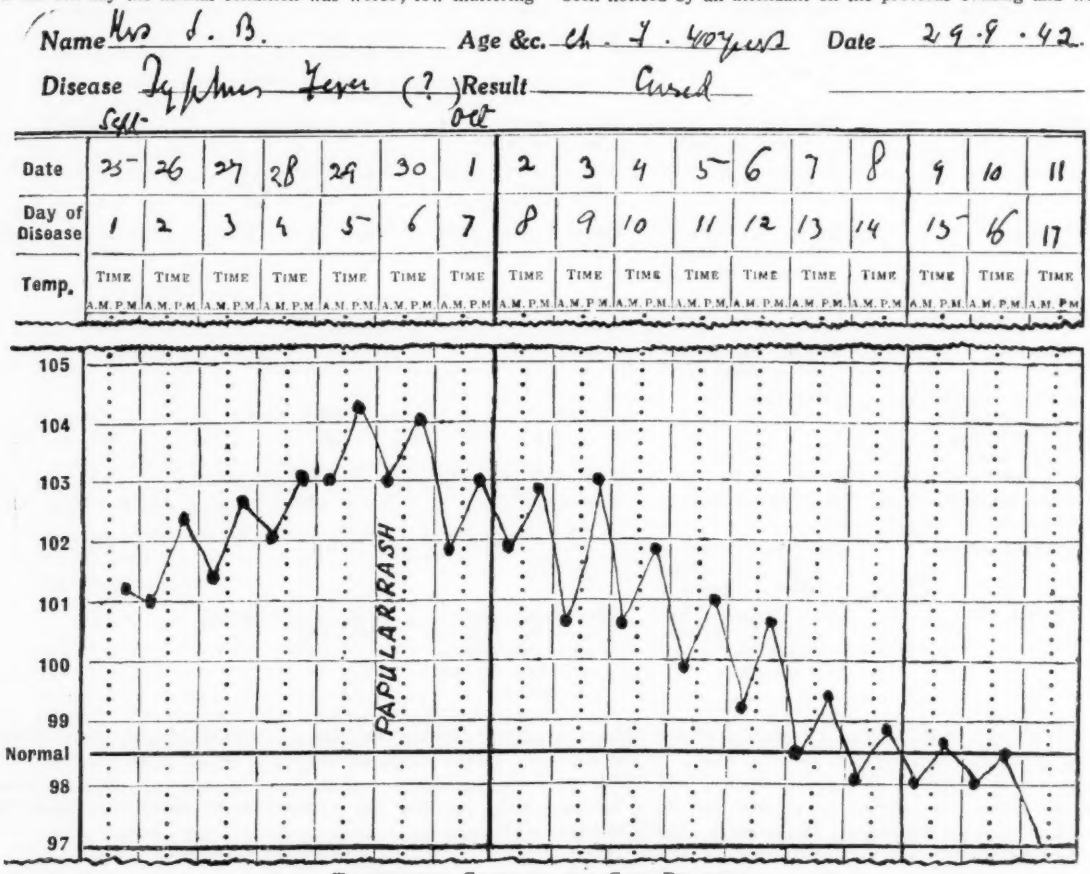
## A CASE OF TYPHUS FEVER

BHUPAL SINGH, B.A., M.B., *Meerut.*

*Clinical picture*—Fever began with pains in the back and joints. When seen by me on the 4th day of the fever the patient was dull and apathetic. The tongue was coated thickly in the centre and the margins were red. There was no distension of the abdomen, no diarrhœa and no enlargement of the spleen or the liver. The pulse was slow and weak. There was marked headache and the pains in the joints and the back were persisting. On the 5th day the mental condition was worse; low muttering delirium supervening. On the 6th day a papular rash appeared specially on the forearms and the legs with a few spots on the sides, front, and back of the chest and the abdomen. It resembled most the rash of secondary syphilis.

*Blood* was examined with the following results:—(1) Total leucocyte count 12,800 per c.mm.; (2) Differential leucocyte count—polymorphs 82%, monocytes 1%, lymphocytes 17%; (3) Widal reaction for typhoid group negative; (4) Weil-Felix reaction negative; (5) Wassermann reaction negative.

*Rash* was noticed on the 6th day; though a few spots had been noticed by an attendant on the previous evening and were




TEMPERATURE CHART OF THE CASE REPORTED.

attributed to mosquito bites. The spots were rosy-red in the beginning then they became darker and faded away in the course of the next week leaving light brown discoloration. The spots were chiefly profuse on the forearms and the legs, less on the arms and the thighs, very few on the chest and the abdomen and there were a few spots on the lower part of the neck—there were none on the face.

*Temperature* was very much like that of a case of typhoid fever—a stepladder rise in the first week reaching 104°F on the 6th day and then coming down by lysis to normal at the end of the 2nd week.

*Nervous symptoms* were marked from the beginning. There was apathetic look and general nervous prostration. There was low muttering delirium about the end of the first week which gradually cleared up.

The symptoms and the course of the disease corresponded with Gen. Megaw's description of cases of tick typhus noted by him in Bhimtal. The patient was in an exceptionally clean family and the possibility of infection through lice was inconceivable. But there were dogs in the house and ticks were noticed in the rooms and infection through ticks was probable.

*Points of interest*—(1) The condition is a rare one. This was the third case seen by me in Meerut in my long practice of 30 years. (2) Apathy and nervous prostration were marked. (3) There was definite leucocytosis with increased polymorphs. (4) The rash was characteristic.

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## INFANT MORTALITY IN INDIA

Though 161·7 babies die in India out of every one thousand born in a year, nothing much have been done as yet to improve matters in this direction. An article on the subject, therefore, is of paramount interest to all those who are concerned with the welfare of India. Dubash's article[1] on the subject published elsewhere in this issue and the last, demand careful perusal and due attention from medical men and public health department of the Government. She has rightly emphasised that "facts should open our eyes and make us realise the appalling conditions prevailing in India as regards the infant mortality rate."

Basak[2] (1938) observed, that at the rate of progress that we are making, 'the infant mortality rate of India will reach the estimated rate of England and Wales for 1937 in about half a century' and while the infant mortality in England and Wales is going down, it is progressing in India. This fact must be faced boldly by all concerned—medical people, economists and politicians. The same state of affairs were prevailing in other countries also but most of them have taken active measures to control this in the form of infant and child welfare societies. In India, such a movement started in 1918 but it has made very little headway and to-day, "infant mortality of British India ranks amongst the highest in the world."[3]

The task of controlling infant mortality in India is fraught with much difficulty, because, here, we are not to fight with disease, maltreatment or economc factors only; we shall have to face lack of education, apathy and mistrust also.

If we consider the age distribution of infant mortality we find that, "the main concentration point of infant mortality appears to be the first month of life of the newly born."[4] This has been vividly shown by Dubash from the health officer's report of Bombay wherefrom she concludes, "the mortality amongst infants at the end of first month of life was thus 3,204 or 37 per cent of the total infant deaths."[5] And we agree that this large number of mortality amongst the new born infants is mostly due to lack of antenatal care. To get healthy children we shall have to take care of the mother. This is a question in which both the medical and the lay public have definite parts to play. To be effective, advice imparted at the maternal welfare centres should be scrupulously adhered to at home;—and one cannot but observe that it is not always possible for a mother having a large number of children to take adequate care of herself during gestation. Economic factor also contributes its share to frustrate our attempts. Then come superstition, lack of education and purdah to pay their quota to the difficulties. Hence first and foremost we require extensive propaganda on the subject through radio, posters, lantern lectures, cinematographic demonstration and model antenatal clinics.

If we analyse the causes of mortality amongst older children we find that, "the principal causes of deaths (excluding still births) may be divided everywhere into the three following groups, *viz.*, (1) Digestive disturbances, (2) Diseases of the respiratory system, (3) Deaths associated with the period immediately following the births."[6] The basic causes have been found to be overcrowding and nutritional deficiencies, particularly vitamin deficiency. Dubash summarises that, "primary cause of infants' death after the neonatal period lies in the bad hygiene, bad nursing, ignorance of dietetics and most of all inefficient maternal care."[7] And she suggests lack of education as the mainspring of these causes of death. In her opinion spread of education can do quite a lot towards the alleviation of the present position. But we are not sure whether only education will be able to do the trick.

Take the case of overcrowding and bad hygiene. No amount of education can wipe out this problem completely, as a man earning say Rs. 50/-, and having four children cannot very well hope to live decently and in a healthy atmosphere, unless the corporations, Municipalities, and the Government replace the *bustees* with airy and roomy mansions for the poor; though proper education can certainly teach them how to use their resources more usefully and decently than at present.

Lack of nutrition involves two problems—provision of nutrition and proper utilisation of food stuff. Infant welfare centres, all over the world, have interested them in supplying free milk for poor children but before we launch into some such project we must consider the question raised by Sankaran.[8] He said,

> "No reliable data are available of the per capita consumption of milk in India. Various nutrition authorities have arrived at varying figures, ranging from a quarter of an ounce per day to three ounces per day. In this assessment, where infants, children and adults are taken into consideration, it is needless to add that infants do require more milk than grown-up children and adults, and yet the most liberal computation does not take us beyond three ounces per day, a consumption less than a sixth or eighth of that in the progressive West. It is, therefore, imperative that our consumption of milk should be increased at least sixfold, if your physical efficiency and well-being should be on a par with those of our

[1] DUBASH, B.M. (1943)—*J.I.M.A.* XII,175.
[2] BASAK, K. C. (1938)—*Ind. Jour. Ped.*, V, 151.
[3] IDEM—*Ibid*, 159.
[4] IDEM—*Ibid.*, 154.
[5] DUBASH, B. M. (1943)—*J.I.M.A.*, XII, 177, 201.
[6] League of Nations—Memorandum relating to the Enquiries into the Causes and Prevention of Stillbirths and Mortality during the First Year of Life, 1930.
[7] DUBASH, B. M. (1943)—*J.I.M.A.*, XII, 201.
[8] SANKARAN, G. (1940)—*Ind. Jour. Ped.*, VII, 216.

brethren in the West. While nutritional requirements urge this reform, we should consider if we have the wherewithal to attain this standard. Increase in our consumption of milk cannot be achieved without throwing open more land for fodder grains and pasture for the milking cattle. As it is, we have just 260 million acres of cultivable land for our 360 million population, or roughly ¾ of an acre per head of population. Nearly four times as much land is required to produce one unit of food through milk and milk products as through cereals or pulses. Three-fourths of an acre is the absolute minimum of land required to feed an adult with just enough calories per annum; it does not make any allowance for first class protein or animal fat or vitamins. We are just on the lowest subsistence level and any attempt to increae the quality of our diet through milk, without the necessary land available for it, is obviously out of question. The only alternative to natural milk is some substitute which could be had without straining our resources of arable land."

We would point out in conclusion that if the Government do not take up the question at once, non-official bodies like Corporations, and Municipalities of the big cities like Calcutta, Bombay and Madras, should take up the problem without delay. Though they cannot ameliorate the countrywide suffering but their lead will certainly give a flip to the official and non-official bodies, who might be able to take up the work on a more extensive scale.

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(*Continued from page 218*)

be continued over a long period. Unfortunately the replacement of water in the veins does not always solve the problem of dehydration. Drugs like cortin (suprarenal cortical extract) will be useful in the maintenance of the blood volume obtained by intravenous infusions. (c) *Ketosis.* Ketosis can be controlled effectively by giving sufficient glucose intravenously. To this end 4 per cent glucose in 1·8 per cent saline is commonly used for infusion fluid. Better results are obtained by the alternate use of 5 or 10 per cent glucose and isotonic or hypertonic saline in the intravenous drip. In only severe cases of ketosis 5 units of insulin should be injected during the period of glucose infusion. (d) *Acidæmia.* Because of overexcretion of basic elements there is a varying degree of acidæmia. The matter gets still more involved when vomiting accompanies diarrhœa and the loss of acid with the vomitus tends towards alkalosis. It is impossible at the bed side to judge in such cases whether the patient suffers from loss of acid or of base. To obviate the difficulty the buffered solutions for intravenous use has been described. (e) *Uræmia.* It is obvious that the efficient treatment of dehydration will get rid of uræmia; glucose is an effective diuretic and for this reason it should be used freely in the intravenous infusions until the flow of urine and the blood urea are restored to normal. (f) *Protein loss.* Plasma or whole blood given intravenously are the best means of raising the level of plasma protein. The quantity to be given will depend on the severity of the illness; it should not be less than 10 c.c. for each kg. body weight. (g) *General measures* are to keep the patient quiet and warm, to give him sufficient sleep (with chloral hydrate by mouth or morphine gr. 1/400 for each year of age subcutaneously), to preserve the skin of the buttocks.

Treatment of diarrhœa without dehydration. The first point to be settled is whether the diarrhœa arises from mischief within the gut or whether it is a symptom of infection elsewhere in the body, a so-called parenteral infection. In the latter case the coincident diarrhœa will clear up with the cure of the primary infection; all that is needed for diarrhœa as such in these cases is to ensure an adequate intake of water and to rest the gut by decreasing all forms of food. The remaining cases are those in which there has been some direct irritation of the gut either by a non-living injurious substance in the food or by infections by living organisms. History is of great value, *viz.*, of an irregularity in the diet or taking of any purgative by the mother when the infant is breast-fed or of any irregularity in diet of older infants. Castor oil—2 teaspoonful to infant one year old will be effective; the infant must be given water or sugar and water and nothing else for the first day and thereafter he can return to normal diet. If diarrhœa persists bismuth or kaolin may be used. Opium should not be used. Treatment of cases of infection of the gut differs in some respect. The initial purge is omitted, a day of complete rest to the intestine with water only *without sugar* is advisable and the restoration of full diet takes place much more slowly except for breast-fed babies. Preparations of apple pulp and pectine agar may be used with advantage. If the infection is prolonged it may be necessary to use protein milk, either freshly prepared or dried and as the symptoms abate the fat and sugar are slowly added. With further researches chemotherapy may be of great value in treatment of infective diarrhœa as sulphaguanidine has proved to be in cases of bacillary dysentery.

### Riboflavin Deficiencies among Chinese: Cheilosis and Seborrhoeic Dermatitis

Hou (*Chinese M. J.*, 1941:59:314) writes that cheilosis (fissures in each angle of the mouth with scaly, chapped and reddened lips) is a common feature of pellagra among the children in the one of the refugee camps. In pellagrins another sign is common, namely, glossitis. In about half of the 186 children cheilosis was present usually of the mild type; others showed ocular lesions only or ocular lesions combined with cheilosis. Treatment with riboflavin caused improvement in some cases on the third day and healing by the sixth day. Treatment by yeast alone caused a somewhat slower course of healing. The dosage of riboflavin was 15 mg. for the first two days and 10 mg. for the next seven to ten days, followed by 5 mg. daily for a week. The seborrhœic dermatitis responded readily to treatment as did the children.

### Ascorbic Acid Absorption in Infantile Diarrhoea

Abt and Farmer (*J. Pediat.*, 1941:18:756) write that ascorbic acid is excreted in small amounts in the stool of the normal infant but after catharsis and in diarrhœa large amount of orally administered ascorbic acid are excreted in the stool. These facts point to a failure of absorption of ascorbic acid from the intestinal tract during infantile diarrhœa rather than to an increased destruction of ascrobic acid by bacteria in the intestinal tract. Thus there is a need for parenteral administration of ascorbic acid as a protection against the development of scurvy in cases of infantile diarrhœa, specially if the latter persists for a longer duration.

# CURRENT MEDICAL LITERATURE

## MEDICINE

### Nutritional Stomato-Glossitis Among War Refugees in Shanghai

Kno and Huang (*Chinese M.J.*, 1941:59:430, Ref. *Brit. J. Dermat. & Syph.*, 1942:59:309) write that stomato-glossitis due to nutritional deficiencies has become very common in China. The diet consists of almost entirely plain rice or congee and in six months the authors treated 237 cases. The following are the types of cases met with: (1) marginal inflammation: one of the earliest varieties, the tip and margin of the anterior part of the tongue are acutely inflamed; (2) indentations of the tongue: the lingual epithelium becomes sodden and macerated; (3) generalized inflammation; (4) the partially atrophic type: atrophic changes of areas of the lingual epithelium and papillæ; (5) atrophic type: complete denudation of the papillæ; (6) pellagrous stomatitis: the tongue is fiery red in color, with or without shallow ulceration, swelling, salivation, tenderness and other signs of acute inflammation are present; therapeutic test with nicotinic acid confirms the diagnosis and other manifestations of pellagra may be evident. Associated deficiencies encountered were nutritional œdema with low serum protein, pellagra, and the ophthalmic and cutaneous lesions of vitamin A deficiency. Cases were treated with either nicotinic acid, diet or liver extract. It was found that if the appetite was not impaired the best treatment was a well balanced diet, nicotinic acid was useful only in pellagrous type—angular stomatitis persists after glossitis has healed; riboflavin is necessary for complete cure and with increase in appetite this is provided by a well-balanced diet.

### Rheumatic Nodules

Hayes and Gilson (*J.A.M.A.* 1942:118, Ref. *Med. World.*, 1942:58:184) from the clinical study of 167 cases of rheumatic nodules in children write that these are usually considered to be indicative of severe cardiac involvement. Nodules are found most frequently on the elbows, knees, scalps, kunckles, malleoli and vertebral spines. Nodules on the extremities are usually symmetrical in distribution. Their duration varies from a few days to several months. The involvement of the heart was present in 163 out of 167 cases reviewed; 52 patients died. The number of nodules present was of no importance in determining the prognosis. Because of the severity of the cardiac lesions in the presence of rheumatic nodules the latter should always be regarded as of serious prognostic significance.

### Dangers of Sulphathiazole

Merkel and Crawford (*J.A.M.A.*, 1942:119 Ref. *Med. World.*, 1942:58:184) report 5 fatal cases and observe from the autopsy findings that there were areas of focal necrosis in the liver, spleen, bone marrow, lymph nodes, lungs and kidneys. The authors stress on the fact that such lesions constitute a positive risk in addition to those which are now familiar when sulphathiazole is used.

### Asthma

Vaughan and Graham (*J.A.M.A.*, 1942, Ref. *Med. World*, 1942:58:266) write that opiates should never be given in cases of severe asthma. The reason is twofold: opiates depress the central nervous system including the respiratory centre; they moreover exert a slight but definite bronchospastic effect and this is what we try to avoid in such cases.

### Typhoid Carriers

Laphir and others (*J.A.M.A.*, 1942:118:964, Ref. *Med. Press*, 1942:208:227) report on the study of the observations on 110 carriers detected following a sharp outbreak in Mountana, U.S.A. in 1939. Of these carriers over one-half had no sign of the disease as such, 57 of 80 cases examined showed radiological evidence of gallblader diseases. In 65 out of 95 cases who submitted to duodenal intubation, typhoid bacilli were detected in the bile. Only two urinary carriers were found, the remainder being considered to have intestinal foci. Even when detected the treatment of carriers is disappointing. Cholecystectomy is successful in over three-quarters of the cases with gallblader foci alone but unfortunately secondary intestinal foci are often present and persist after the gallbladder has been removed. Drugs of the sulphanilamide group provide a ray of hope, but results so far have not borne out the initial optimism. The authors have tried tetraiodophenolphthalein and have been able to clear the gallbladder in roughly half the cases; the treatment is worthy of trial among gallbladder carriers before cholecystectomy is considered.

### Insulin in the Treatment of Underweight

Greco and others (*Am. J. Med. Sc.*, 1942:204:258) in reporting on the study of the effect of insulin injection in a series of 38 adults, ranging in age between 17 and 50 observe that all were healthy apart from underweight and lack of appetite, all gained in weight, the amount of gain varying from 1 to 27 pounds and there was considerable increase in appetite. A control test to determine whether or not the effect of the injection was psychic was made with injection of normal saline solution for 4 to 5 consecutive days in the middle of the period of insulin treatment and the result was lack of appetite in the patients so treated, the appetite returning on resumption of insulin injection. Insulin was given only once a day in progressively increasing doses, starting with 8 units and not exceeding 30 units, about 45 minutes before midday meals and when the desired effect is obtained insulin is gradually decreased in dosage and then discontinued. No cases of glycosuria occurred among the treated patients after the cessation of insulin treatment.

### Treatment of Nephritis

Roper (*Med. Press*, 1942:208:208) deals with the subject under the headings of:

*Treatment of acute inflammatory nephritis*: *Rest.* Physical rest in bed between blankets at first is essential until not only has blood disappeared from the urine but œdema also and if possible albuminuria (two months or more). *Diet.* Protein must in all cases be greatly restricted in the early stages, if not withheld completely for the first few days to lessen the work of the kidneys. Milk is an important protein food and conse-

quently largely unsuitable; fats may cause sickness and best discouraged. The diet, therefore, must consist predominantly of carbohydrates which impose no work on the kidneys. As soon as possible a restricted amount of protein should be added to the diet and it is here that an estimation of the blood-urea is a valuable guide as to the earliest date that is permissible. Speaking generally where there is adequate diuresis and no great rise of vascular tension it is advisable after a few days to reintroduce protein even if there is considerable albuminuria. *Intake of water* should be restricted for a week or more. For an adult 35 to 40 ounces of water including fruit juices taken, may be allowed daily. Where there is œdema it is specially wise to watch the water-balance, keeping the water intake just below the measured total diuresis and in such cases salt should also be discouraged. Magnesium sulphate should be the aperient of choice. *Treatment of symptoms.* Convulsions are best treated by venesection, supplemented by rectal introduction of 4 ounces of a 50% solution of magnesium sulphate; bromide and chloral may also be given and in very severe cases a single injection of one-sixth grain of morphine may greatly benefit. When there is œdema lumbar puncture may be of great aid. *Removal of focal sepsis.* This is essential as soon as the acute condition will allow. It has been shown that a high protein diet in presence of sepsis favour renal damage.

Subacute and chronic nephritis: The types met with are (1) the œdematous or nephrotic type in which the main symptoms are œdema which may be enormous and is accompanied by chloride retention, diminished diuresis and heavy albuminuria but with no failure of renal function; (2) the type in which there may be no œdema and only slight albuminuria but in which the developed picture includes evidence of renal insufficiency together with any or all of such signs as hypertension, compensatory polyuria and retinitis and (3) mixed types. *Patients with pronounced œdema* approximating to nephrotic œdema. Protein should be given in fair abundance in cases of nephrotic type as there is no nitrogen retention and substantial reduction of salt in diet should be done as there is chloride retention. The amount of water allowed should be determined by noting the water-balance. *Drugs* such as, urea (15 gms. in 3 ounces of water twice or so daily), ammonium chloride (2 to 4 gms. in water twice or thrice daily), mercurial diuretics such as salyrgan, mersalyl and neptal with ammonium chloride are sometimes very useful. Thyroid gland with gradual increase of dose has been found effective in some cases. Iron in adequate doses to counteract the microcytic anæmia as well as tapping in ascites which occurs inspite of the adoption of the measures mentioned above. *Azotæmic chronic nephritis.* Dietetic guidance is all-important in these cases probably laid down in the light of periodic blood-urea estimation. If there is no evidence of nitrogen retention amply sufficient protein for the metabolic needs may be allowed. If there is retention protein should be restricted. Meat extract should be avoided, fats restricted to some extent, excess of salt avoided and if there is no failure of diuresis water may be allowed freely. Where this is associated with signs and symptoms of cardiac failure digitalis is of service and if there is œdema along with it fluid should be restricted and such drugs as theobromine (10 grains thrice daily) or mercurial diuretics and theophyllin compounds may be used with benefit.

## SURGERY

### Advances in General Surgery

Finch (*Practitioner*, 1942:149:193) deals with the subject under the headings of:

*Problem of infection.* The main source of infection of wounds in hospital is "by contact with soiled fingers, instruments, dressings, and lotions, by infected droplets from the mouth and nose of those nearby when dressings are off; and from dust in the air in the ward." Therefore, the dressing team must wear mask, all dressings must be done with sterile forceps, the routine dressing round must not be commenced until at least one hour after the beds have been made and floors swept; the ward doors and windows are closed to prevent draughts during dressings; first time dressings should be done first unless known to be already infected; sterile gloves must be worn for all septic cases. *Surgical cases.* The causation of shock is no nearer elucidation. The cardinal principles of treatment, however, remain as before, *viz.*, relief of pain, warmth and fluids. If there has not been any hæmorrhage then whole blood is contraindicated, plasma or serum being preferable. If fluid is given for more than 24 hours the balance of fluid intake and output should be carefully noted. The adrenal cortical hormone does play some part in the defence mechanism of the body against the effect of injury and has been recommended both as a prophylactic before operation and in the postoperative treatment. Inhalation of oxygen (95 to 100 p.c.) either by the B.L.B. mask or 'spectacle frame catheters' will increase the saturation in the blood upto 10 to 15 p.c. and in cases of collapse due to peritonitis it will reduce the intestinal distension. *Treatment of wounds.* The treatment is epitomized by Payne as follows: (1) examination of the wound under an anæsthetic, (2) determination of the extent, (3) removal of foreign bodies and dead tissues, (4) arrest of hæmorrhage (effused blood is dead or dying tissue), (5) provision of drainage if required. Wound should be excised very early or very late, *e.g.* before 6 hours or after 6 weeks. The excision requires meticulous care and is a time-consuming job—no treatment by chemotherapy or any other therapy, can excuse the surgical 'toilet' or 'revision' of a wound from being thoroughly carried out. Immobilization in plaster of Paris is necessary but the patient must be watched for persistent pain in the injured part, swelling and sustained fever which are indications at least for splitting the plaster and inspecting the wound. In the actual excision of the wound various 'tips' have been suggested for detecting the necrosing tissue, such as, excision under a constant stream of saline which causes the necrotic tissue to float up or scrubbing the wound lightly with lysol 120 minims to a pint of saline, which stains the necrotic tissue dirty grey. Opinions differ as to whether the wound should be packed and closed under plaster of Paris or treated by moist method, *i.e.*, Carrel Dakin or some modification. If packed, the usual method is by vaseline gauze, it may be gauze alone after dusting the wound well with sulphanilamide powder or filling the wound and all interstices with ZIPP (zinc oxide 1 part, iodoform 2 parts, paraffin 2 parts) or with ZISP (Sulphanilamide 1 part replacing 1 part of iodoform) or with urea or with pectin solution in which case the wound cannot be closed by plaster of Paris as the gauze must be kept

wet with the solution. Panicillin has been tried at Oxford and found an effective therapeutic agent in preventing and treating infecting wounds. *The tourniquet.* Although it is lifesaving in certain circumstances it should be used discretely. It is far better to stop hæmorrhage by pressure with either ligature, forceps, plug or bandage. When used it should be released from time to time and discarded as soon as possible. *Gas-gangrene.* The gas-producing organisms are introduced by the foreign bodies and not by soil as cases have been recorded after wounds received on board ship. Treatment with deep x-ray has met with very successful results in America and Australia. *Tetanus.* The active immunization with tetanus toxoid has been amply justified by results—the incidence in the present war is 0·05 per 1000 compared with 8·0 per 1000 in the last war. All agree that a massive dose of 200,000 units should be given initially, whatever the route employed. The convulsions can be controlled by avertin or during transport by sodium pentothal. In tropics intramuscular injections of M. & B. 693 have been used with success and convulsions controlled by sodium evipan. *Substitution of surgical materials.* Linen thread is being used exclusively for intestinal suture—it can be boiled in water which is alkaline without rotting but the latter will cause silk to rot. Coates' cotton is economical, leads to little serous reaction and boiling does not diminish the tensile strength. Some think it should not be used for continuous suture. *Varicose veins.* It is necessary to determine that the disability complained of is due to varicose vein and not to such anatomical deformities, as flat feet, os calcis spur or hallux rigidus. The circulation of the patient should be viewed as a whole. The presence of occlusion of the deep veins, saphenous varix and active thrombophlebitis must be excluded. When none of these is present the injection of sclerosing fluid into the lumen of the veins is quite satisfactory. The most popular solutions are 5% sodium morrhuate or 5% monoethanolamine oleate and the dose is usually 2 to 3 c.cm. given at weekly intervals at one or more points directly into the lumen of the vein with the patient standing. *Heparin* has been used both for the prevention of thrombosis and the treatment of pulmonary embolism. It is extremely useful after the suture of wounds of arteries, either accidental or after embolectomy. *Burns.* With burns of the 1st and 2nd degree the 'drys' or 'coagulants' have it, but for burns of the 3rd and subsequent degrees 'wets' or saline bath adherents can show good results. The best treatment for deep burns is to treat them like any other wound by excision and skin grafting. Keloid changes may be, to a great extent, prevented by massage with lanolin (B.P.) as soon as healing will permit. The shock in burns must be treated with plasma or serum as there is more or less hæmoconcentration. 500 c.cm. is required if hæmoconcentration is 125 per cent and 1000 c.cm. if more than 125 per cent. *Septicæmia.* Cases of staphylococcus septicæmia with positive blood culture has been treated successfully with massive dose of sulphathiazole. *Appendicitis.* In so-called chronic appendicitis Alvarez of the Mayo Clinic has sounded a note of warning not to expect much amelioration of symptoms after appendicectomy if there is no history of previous subacute attack. Chemotherapy in the form of sulphanilamide powder or a supension of it (10 gm. in 4 ounces of saline) left in the 'acute' abdomen after operation is said to do no harm and improves prognosis. *Strangulated hernia.* Douglas points out that in patients over 70 the mortality even after operation is 30%. Death is usually due to pulmonary complications. He advises in these cases washing out the stomach, local anæsthesia, firm bandaging and getting the patient out of bed within 48 hours of the operation. *Head injuries.* Cairns makes a strong plea for making the wearing of a crash helmet compulsory for every motor cyclist as fatal head injuries are very common in motor cycle accidents. *Fractured ribs.* In fractured ribs the acute pain is probably due to presence of spasm and the chronic to bruising of the muscle and this pain can be relieved by the injection of a local anæsthetic along the external aspect of the rbis (10 c.c. of precaine, 1 in 1000). Blades recommend for immobilizing the chest to encircle completely the costal margin at the end of expiration with a single strip of 4-inch strapping as this is more efficacious than the usual way of strapping half of the circumference of the chest. *Cancer.* Early diagnosis is essential. It must not be forgotten that except in a new growth in bone, neoplasm (including cancer) is painless in early stages. The treatment of cancer of the mouth is radiation except when it develops in a syphilitic lesion when surgery will have to be considered. In cancer of the penis, radiation should be tried before surgery; in cancer of the lung, surgery alone holds out hope at present; in cancer of the bone, x-ray investigation and biopsy is necessary. In cancer of the breast before 40, a complete treatment by deep x-ray should be carried out both to the breast and areas of lymphatic drainage, to be followed by a local mastectomy. The same treatment applies to the apparently inoperable cases in older patients. In cases over 40, a preliminary treatment is essential by deep-x-ray to be followed within 24 hours by a complete mastectomy including the axillary glands to be followed by a full course of deep x-ray treatment.

### Anaesthesia in Aged Patients*

Alcock (*Med. Press & Circular*, 1942:236:44) refers to the following general considerations, which are of special importance in elderly patients: (1) The aged are usually placid and co-operative subjects. (2) They require less anæsthetic. Elimination is slow, because of the lowered metabolic rate. (3) Abundant oxygen is necessary, particularly if shock is present. (4) Powerfully narcotic and depressant drugs as prophylaxis against chest complications should be avoided, particularly in those with pre-existing chest trouble. (5) Avoidance of toxic drugs in such conditions as diabetes, uræmia, abdominal emergencies etc., is important in all patients, but particularly so in the aged.

*Premedication.* The following points are stressed:—(1) Importance of pre-operative glucose and sedation, (2) Pernicious effect of excessive starvation and purgation. (3) Administration of morphia and atropine 1½ hours preoperatively. (4) Avoidance of depressive basal hypnotics. (5) Usefulness of pentothal for induction.

*Choice of Anæsthetic.* Nitrous-oxide oxygen is recommended by the author as it is non-toxic. For abdominal surgery, however, it must be supplemented and for this the following are available:—(1) Chloroform and di-ethyl-ether are condemned—the first for its high toxicity, the second for toxicity and irritant qualities. (2) Cyclopropane, di-vinyl-ether and trichlorethylene are all valuable, though with the last relaxation may not be perfect. (3) 'High' spinal anæsthesia is

risky owing to the strain imposed on the vascular system. 'Low' spinal anæsthesia, for example for hæmorrhoidectomy, is permissible. (4) Regional analgesia is suggested as the best supplement to nitrous-oxide oxygen. Techniques suitable for most conditions are easily acquired and the method is safe even in unpractised hands if due precautions are taken.

### New Treatment of Post-Concussion Headache

Malone (*J.A.M.A.*, 1942:119:861) writes that the post-concussional syndrome includes severe headache, dizziness and emotional disturbances. The headache is usually localised and may be aggravated by straining, or looking upwards—also by work. Nystagmus is often present. The pathology of the condition has not been definitely determined. Some believe it is entirely functional; others are convinced that there are organic changes. Adhesions in the subdural space have been suggested, degenerative changes in the nerve cells have been described, and local vasomotor instability has been blamed for the headache.

With regard to treatment, sedatives have little lasting effect; ergotamine tartrate is not helpful; air insufflation has been tried, to break up adhesions, and on the whole treatment may be said to be unsatisfactory. The author reports two cases to whom he gave 15 mg. of prostigmine bromide by mouth three times a day, and an intramuscular injection of 1 c.c. of 1:2000 prostigmine methylsulphate twice a week. Considerable improvement occurred within a few days, and complete recovery took place in one case within a month. As adjuvant therapy it is suggested that the intake of fluids should be restricted and sodium salts be replaced by the corresponding ammonium salts to favour some dehydration.

## OBSTETRICS AND GYNAECOLOGY

### A Clinical Study of Menstruation with Special Reference to Primary Dysmenorrhoea*

Taylor (*J. Obstet. & Gynec. Brit. Emp.*, 1942:49:341) writes that two hundred women, 189 of whom came under the British National Health Insurance Scheme, and 170 of whom suffered from some degree of primary dysmenorrhœa, were given a thorough physical (including pelvic) examination, and detailed notes were made of their menstrual history, their environment and habits. The age of onset of menstruation varied from 10 to 19 years, 83 per cent being between 12 and 15 years. Few had absolutely regular periods. Many healthy girls who were generally regular to within a few days had periods of temporary irregularity. The patients were divided into 5 groups according to the severity of their dysmenorrhœa. In each group an analysis was made of the nature and duration of the pain, the development and position of the uterus, the association of certain distant menstrual symptoms (*e.g.* headache, fatigue, skin changes) and the presence of some conditions of general health and temperament. The author reviews the more important theories of the ætiology of dysmenorrhœa in the light of the clinical experience gained during this investigation. The conclusions reached may be summarized as follows: (1) Normal menstruation should be free from all pain and discomfort and should not cause depression of physical or mental capacity. At present the majority of women are predisposed to the development of dysmenorrhœa by their ignorance of the true nature of menstruation and the lingering influence of old superstitions and taboos. This predisposition is increased by any interruption of usual activities during the periods. (2) Isolated attacks of dysmenorrhœa may be due to many conditions, (*e.g.* chill, emotional shock) accidentally associated with a menstrual period, and are of no importance in themselves. Habitual menstrual malaise, however, makes their repetition easier. Dread of a return of the pain and fear of functional incapacity appear with succeeding attacks and greatly increase the likelihood of severe dysmenorrhœa becoming established. (3) Particular constitutional and environmental conditions act as subsidiary factors in susceptible individuals. The author recommends that all should be taught to regard menstruation as a normal function which should interfere with none of their usual activities. They should be given an outline of the physiology of the sex cycle and the facts of reproduction before their own emotional reactions to sex become acute. In the treatment of established dysmenorrhœa an explanation should in addition be given to the patient of the mechanism of the production of the pain, and the part played by her emotions, especially fear, in causing its recurrence. Her anxiety about the health and development of her sex organs must be relieved. Any constitutional or environmental defect should be dealt with. Patients who do not respond to these measures should be referred to a psychologist. Surgery ought to have no place in the treatment of primary dysmenorrhœa.

## PEDIATRICS

### Treatment of Diarrhoea in Infants

Harris (*Practitioner*, 1942:149:151) discussed the subject under two heads: (1) the ways of combating the grave constitutional effects of the disorder and (2) the treatment of the causes.

Treatment of secondary constitutional disturbances. (a) *Collapse.* Treatment is to get and keep the infant warm and quiet using hot-water bottles, electric blankets or heated cradles and by cutting down to basic minimum the handling of the infant. Nikethamide solution 0·5 c.c. may be used as direct stimulant or lobeline gr. 1/20 may be used when the respiratory centre is flagging. (b) *Dehydration.* Treatment of dehydration is to restore fluids to the cells, to the tissue spaces and to blood stream. Fluids by mouth and per rectum are not practicable because of vomiting and diarrhœa and it remains, therefore, to replace the fluid by subcutaneous, intraperitoneal or intravenous infusions. Subcutaneous infusion has certain drawbacks: there is a limit to the amount and rate of flow, the fluid given must be isotonic with blood and must not contain glucose which irritates the subcutaneous tissues; infants over nine months do not tolerate readily the procedure of subcutaneous infusion. Intraperitoneal infusion has the advantage of quick absorption of a fairly wide number of isotonic fluids, infusion is to be stopped as soon as the respiration begins to be embarrassed. Intraveous infusions: A large number of isotonic and hypertonic salt and glucose solutions can be given by this means, so too can blood and plasma; the rate at which the fluid is given can be varied within wide limits; the infusion can

(*Continued on page 214*)

# NOTES AND NEWS

## THE PHYSIOLOGICAL SOCIETY OF INDIA

The Eighth Annual General Meeting of the Physiological Society of India was held in the Presidency College, Calcutta on 13-3-43.

Prof. M. N. Saha and Mr. N. Das Gupta made some interesting observations on neutrons which can penetrate into living tissues and expose protons from H elements in tissue and thus profoundly affect them. The power of neutrons in killing bacteria and destroying neoplasm is many times greater than that of radium and x-rays because of their greater penetrating power. Therefore, there is great possibility of utilising the neutrons for therapeutic purposes and co-operation of the physicist, the medical men and the physiologist is earnestly called forth in this direction. Another use of the neutron is the great magnification afforded by the electron microscope by which it has already been possible to demonstrate the bacteriophages and colloidal molecules.

The election of the office-bearers for 1943 was then announced to be as follows: *President*—Prof. N. M. Basu, *Vice-Presidents*—Prof. B. B. Sarkar, Prof. N. C. Bhattacherji, Prof. B. Narayana, Dr. W. R. Aykroyd and Prof. W. Burridge. *Secretaries*—Prof. P. De and Dr. R. K. Pal. *Asst. Secretary*—Mr. G. N. Bera. *Treasurer*—Dr. B. B. Chatterji.

## SIR S. BHATNAGAR ELECTED F.R.S.

According to a news received from the United Kingdom, Sir Shantiswarup Bhatnagar, Director, Board of Scientific and Industrial Research, has been elected a Fellow of the Royal Society. He is the first Indian chemist to receive this distinction.—A. P.

## INDIAN CHEMICAL MANUFACTURERS' ASSOCIATION

The Committee of the Indian Chemical Manufacturers' Association recently met Mr. Ram Chandra, the Chief Controller of Imports at the premises of the Association when the difficulties experienced by the chemical and pharmaceutical Works for importing essential raw drugs, medicines etc. were discussed. The Chief Controller stated *inter alia* that the Government did not consider only those drugs and medicines useful for war purposes as essential but also included civilian need under the category of 'essential' drugs and medicines. He has assured the association that essential drugs and medicines required by the manufacturers in the country for civilian needs will always receive immediate attention of the Government. The Chief Controller of Imports has further stated that the Government will be willing to give necessary permit for importing quinine from foreign countries provided the latter are prepared to allow its export. The Committee also referred to the necessity of allowing import of codeine and other opium alkaloids from the U.S.A. and U.K.

## PROGRESS OF MEDICINE IN SIBERIA

For centuries people have shuddered at the name of Siberia as the Andamans of Tsarist Russia, where unfortunate victims of Tsarist justice used to be exiled. It may come as a surprise to many that centres of learning and useful research conducive to human welfare can spring up in this neglected corner of the globe. Progress in Siberia in medicine, for instance, has been reflected in a scientific conference organised in July of the last year in the Siberian capital of Novosibrisk by the All-Union Institute of Experimental Medicine, according to a report published in *Science*. The conference which was attended by three hundred surgeons and scientific workers was devoted to the survey of the work of the medical institutions in Siberia, now actively engaged in solving medical problems arising out of the abnormal conditions of the war. Eighty-five reports and communications dealing with the successful investigations of several problems were submitted. Some of the important investigations mentioned in the report comprise treatment of gunshot fractures, accumulation of matter in the pleural cavity, adaptation of Roentgen-therapy and of new apparatus for mechano-therapy. According to Dr. Pogorelsky's experience, irregular concrescence of high fractures can be treated into normal position through bloodless transference. Bullet or shell fragment injuries often bring about traumatization or annihilation of parts of the nerves and consequent loss of sensibility of portions of the body. Professor Davretier has studied the regeneration of the nerve-trunk conduction which has helped thousands of soldiers suffering from injuries of the peripheral nerves to resume normal activity. The demonstration of Dr. Freifeld's wooden set for mechano-therapy and medical splint for active movements of fingers and hand aroused considerable interest amongst the delegates to the conference.

The successful development of Roentgen-therapy by Professor Pavoletzky and Dr. Khalisky for the treatment of war traumas is another instance of progress in medical research by Siberian doctors.—*Science & Culture.*

## BENGAL CIVIL PROTECTION COMMITTEE

The aim of the Bengal Civil Protection Committee, a voluntary non-political body formed early in 1942 by men of varying schools of thought at the instance of the Congress President, Maulana Abul Kalam Azad, is to help any who have been caused physical suffering in these difficult days.

Twenty-two First Aid centres have been opened in various parts of Calcutta. All these centres have been well equipped with medical supplies and manned by volunteers. At two centres help was rendered to people wounded during the recent raids. This Committee undertook to open centres on the Assam border to help the sick and the ailing refugees from Burma. Later the call came to the Committtee to provide Mobile Squads to help refugees whenever there was evacuation from Calcutta.

Six lorries have been purchased and equipped as ambulances and mobile medical dispensaries. To each lorry is attached a doctor-in-charge, three assistants and a driver. All these young men are trained in First Aid and Fire Fighting and some are qualified compounders. The units were placed at various points along the evacuation routes ready to give medical aid to those who fled from Calcutta after air-raids. They urged the villagers to take inoculation against cholera, typhoid fever, and smallpox. They were able to inoculate many hundreds of people.

(*Continued on page 220*)

## BOOK REVIEWS

HANDBOOK OF PRACTICAL BACTERIOLOGY—By T. J. Mackie & J. E. McCartney. Sixth Edition, 1942. Pages xi+675. Royal 8 vo. Published by E. & S. Livingstone, 16 & 17 Teviot Place, Edinburgh.

'Mackie & McCartney' needs no introduction and I doubt very much if there is any laboratory of worth which does not possess a copy of this extremely useful handy book. Since its first publication in 1925, it has undergone vast changes and these changes were undoubtedly towards improvement. In the preface the authors have claimed that they have endeavoured to make the book useful to various groups of readers. I have got no hesitation in saying that they have succeeded in their attempt exceedingly well and the authors should be congratulated. The detailed description of the various laboratory technical methods, preparation of media, general description of the biological properties of the microbes and the various diagnostic methods have been so admirably dealt with that besides providing the wealth of information it makes a pleasant and interesting reading to go through it. The book is a vast storehouse of information and an invaluable aid to all interested in this branch of medical science.

B. P. TRIBEDI.

SURGERY OF MODERN WARFARE—Edited by Hamilton Baily. Vol. I, Second Edition, 1942. Page xvi+480. S. Royal, with 375 illustrations, many in color. Published by E. & S. Livingstone, 16 & 17 Teviot Place, Edinburgh. Price 40s. net.

The second edition has appeared within a year of the first and is issued in two volumes. The first volume in eight sections deals with "wounds"—their general and special considerations, wounds of vessels, of the head and neck, spine and trunk (including thorax and abdomen).

Never, except with experiences in modern war surgery has the principle of "look and see" rather than "wait and see" been more thoroughly and completely confirmed. "Debridement" has fallen into disrepute and has given place to "routine wound excision" with a few exceptions, *e.g.*, with the face where the author has rightly stressed that "routine wound excision has no place in facial surgery".

The manual is a tribute to the assiduity, industry and experience of the joint authors under the editorship of Mr. Hamilton Bailey who is no less a contributor himself.

It is a mine of practical information in which any one in difficulty will find the kind of practical solution that he may look for in many a text book in vain. Its distinctiveness lies in its accuracy and shortness and in the profuse manner in which it has been illustrated with explanatory captions planned with great care. Each chapter is well-balanced, exact and authentic, avoiding encyclopædic manner of alternative confusing procedures—most of the chapters being appended with valuable references. Its high standard both literary and scientific is really outstanding.

The authors have been well served by the publishers who have maintained their high standard in paper, print and publishing in spite of prevailing difficulties.

AMARNATH MUKERJI.

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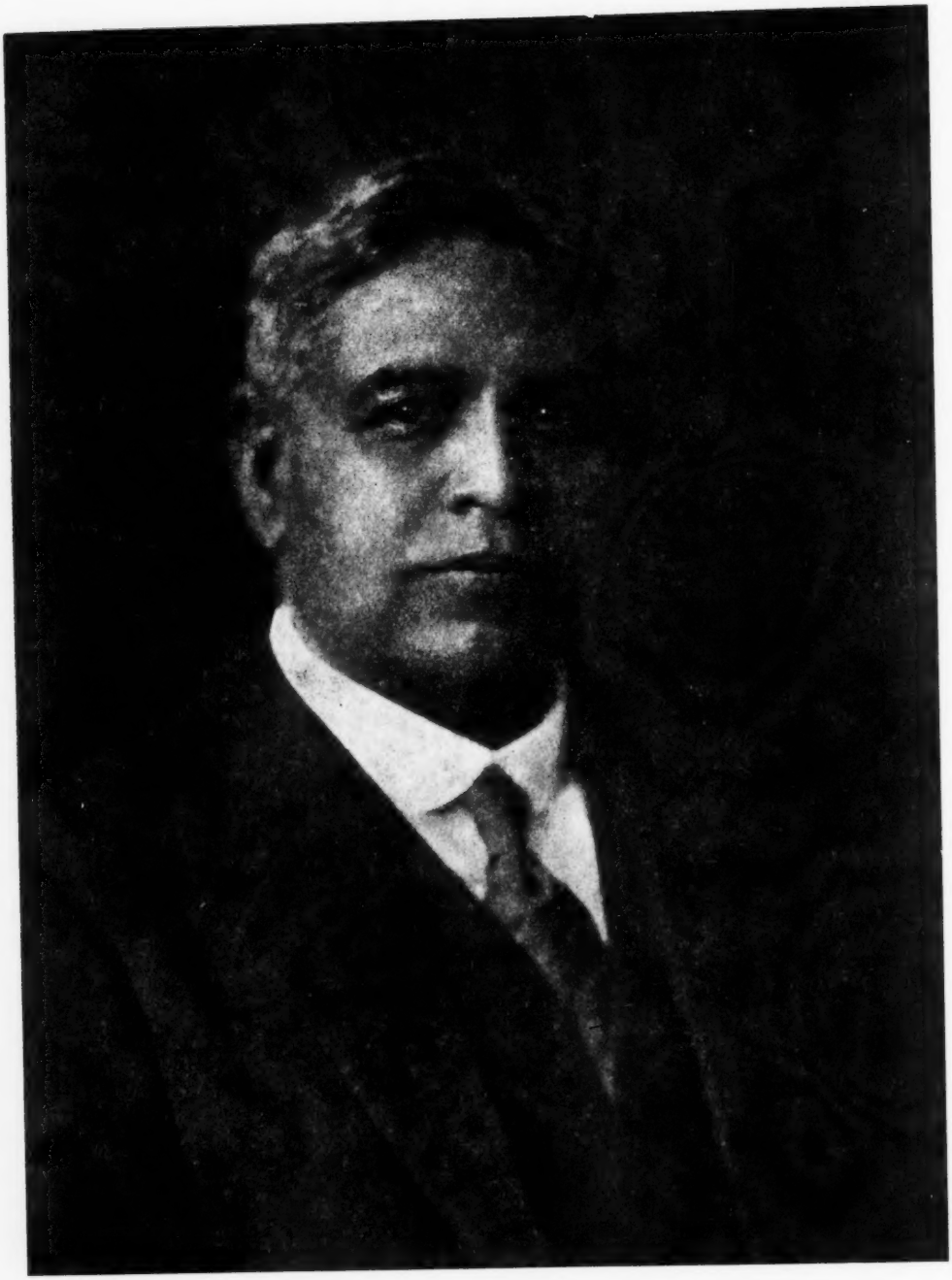
(*Continued from page 219*)

After the last December raids when thousands of evacuees left Calcutta teams were on the road to meet them, and further units were sent out to points where congestion was reported and no epidemics occurred this time, but help was given to a number of refugees suffering from exhaustion and other minor ailments. A few evacuees were inoculated against cholera.

The B. C. P. C. was also one of the first voluntary bodies to send relief workers to the stricken Midnapore area. They left Calcutta a few days after the tragedy occurred and rendered immense service. Thousands of cases were inoculated against cholera. Sufferers from cholera, dysentery, malaria and other sickness were attended and cured.

The B. C. P. C. needs the goodwill of every citizen as much as their most generous contributions. It is estimated that in order to maintain the present services adequately it will need an income of at least Rs. 15,000/- a month. Contributions may kindly be sent to Mr. B. M. Birla, Treasurer, Bengal Civil Protection Committee, 8, Royal Exchange Place, Calcutta or to Dr. K. S. Ray, Chairman, Medical Section, The Bengal Civil Protection Committee, 6A, Surendranath Banerjee Road, Calcutta.

A voluntary body, trained for the relief of suffering and ready to go anywhere in Bengal, has certainly a useful place to fill in these difficult days.



THE LATE SIR NILRATAN SIRCAR